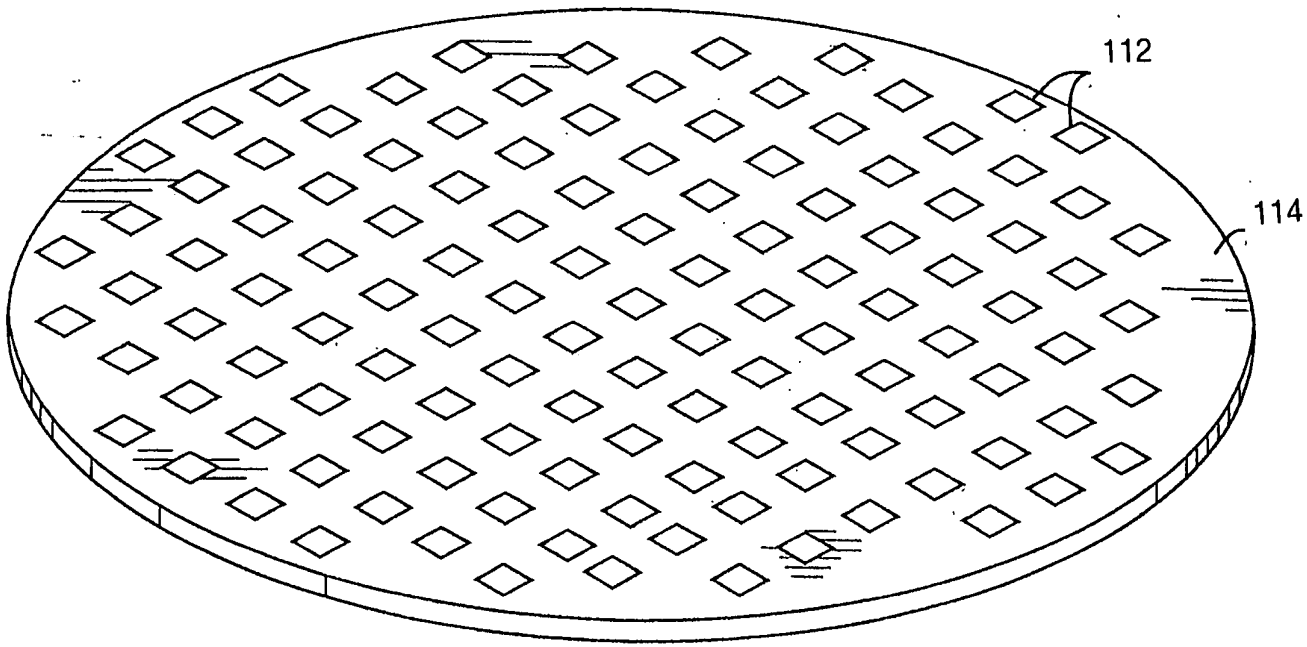


FIG. 1

66h72t'0960960

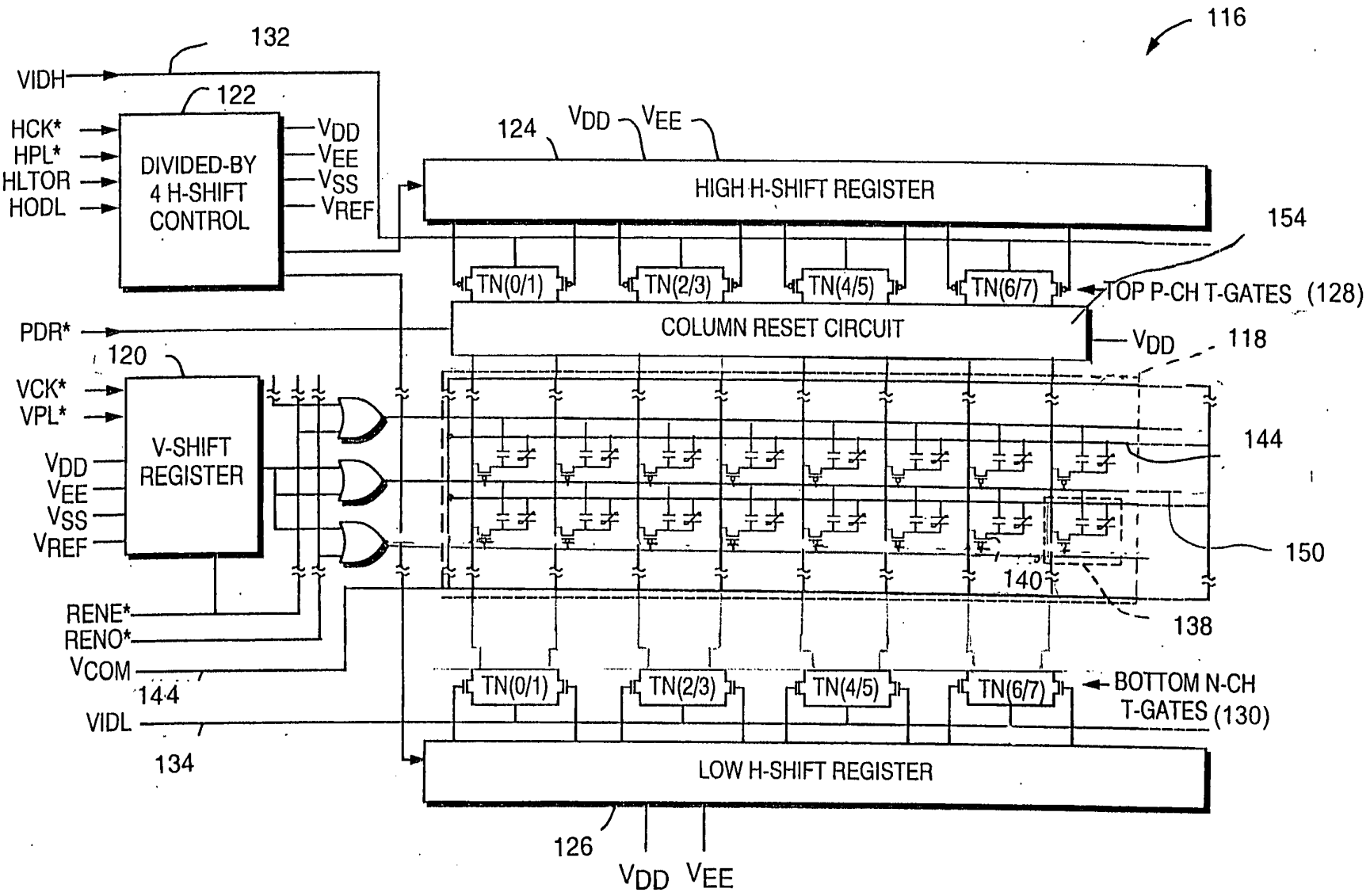
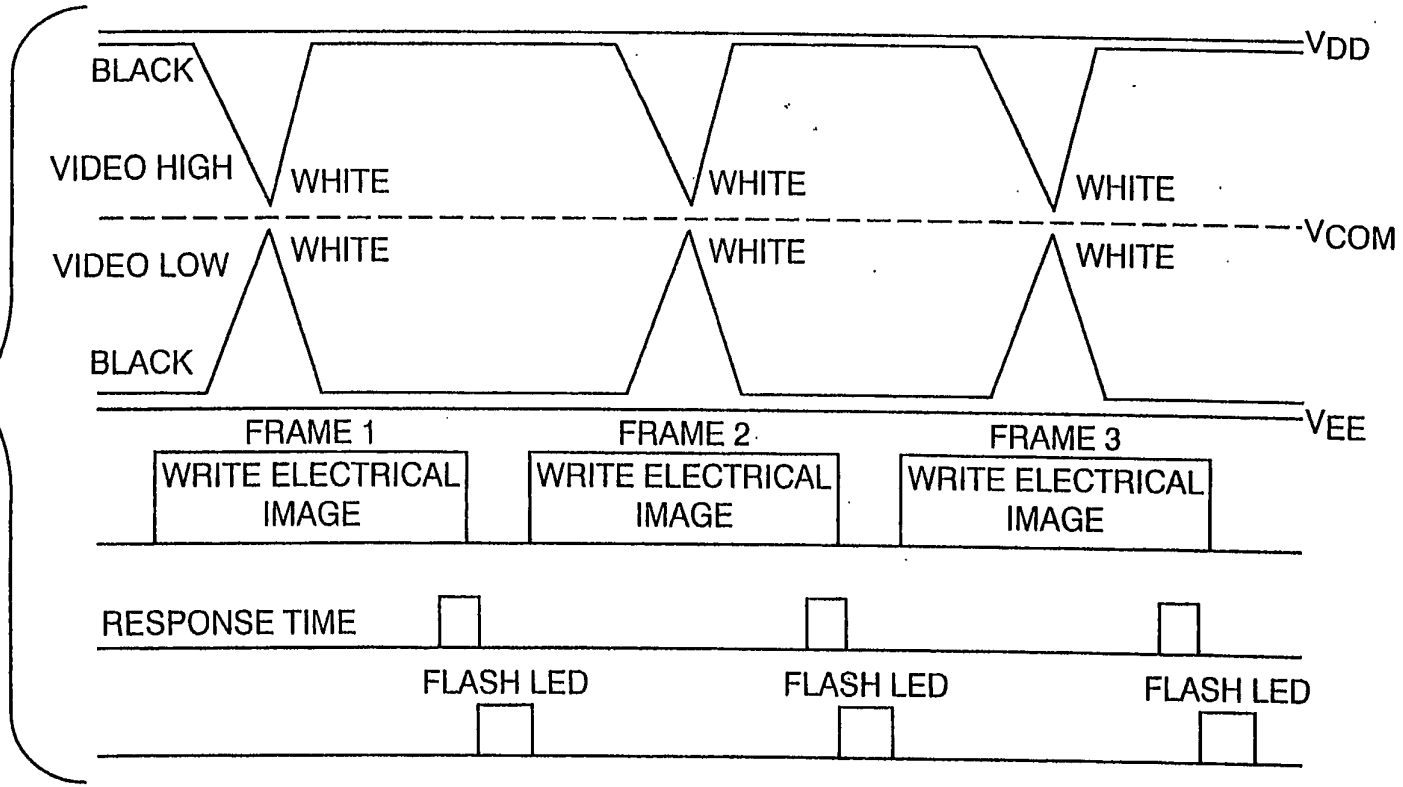


FIG. 2

6611271 09699460

FIG. 3



66h727 0960960

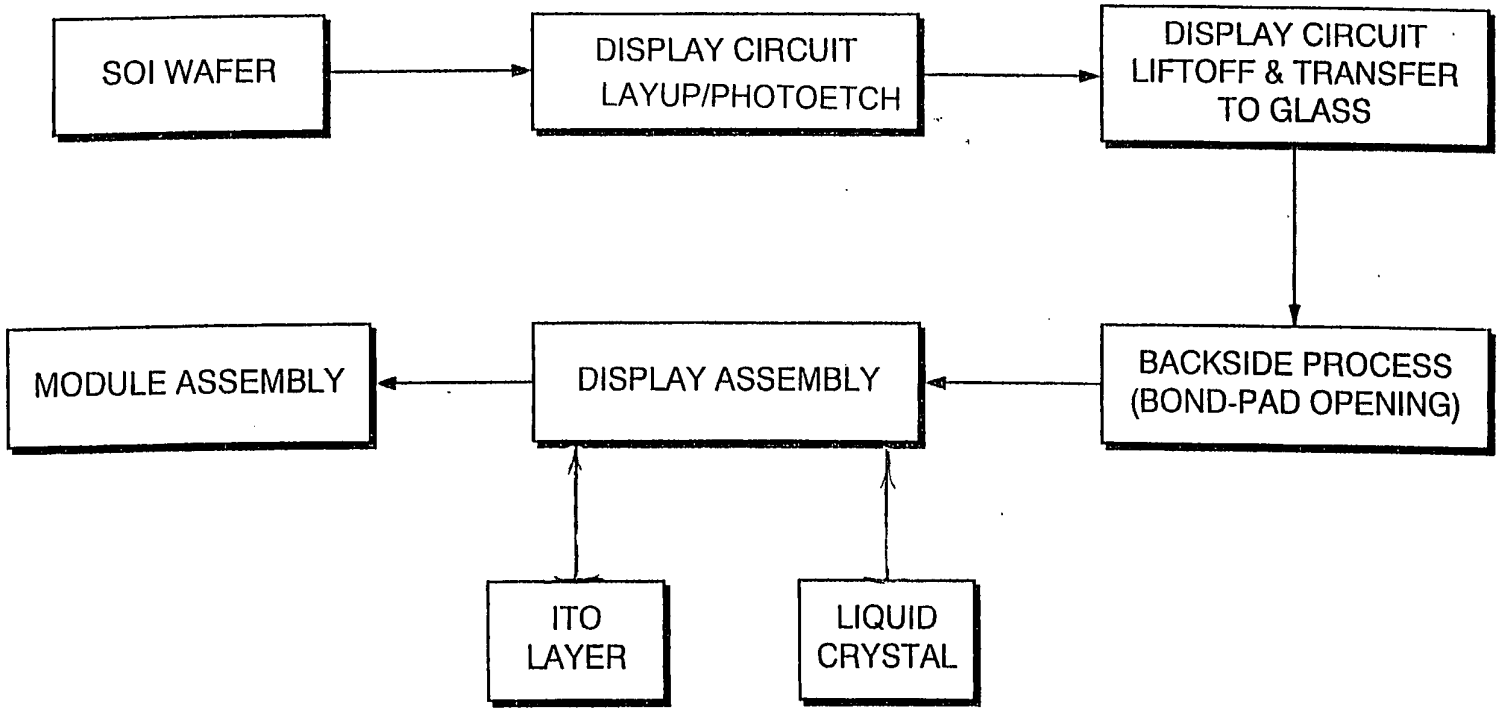


FIG. 4

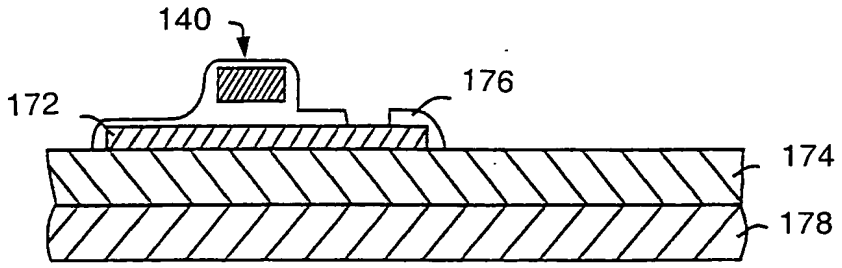


FIG. 5A

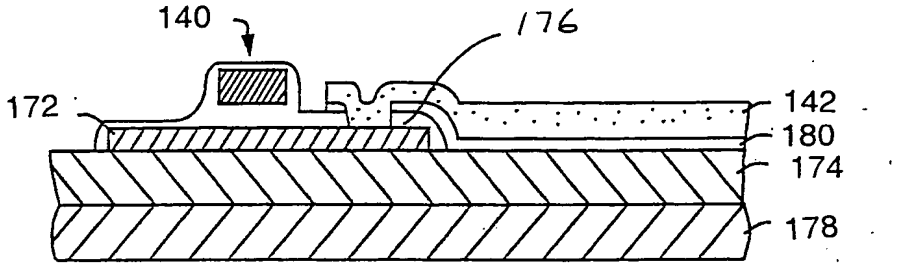


FIG. 5B

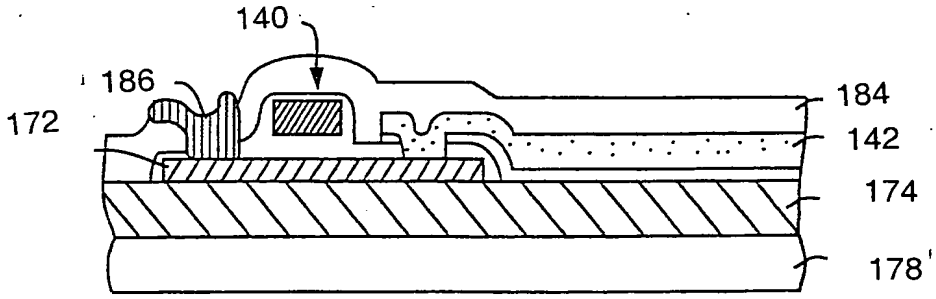


FIG. 5C

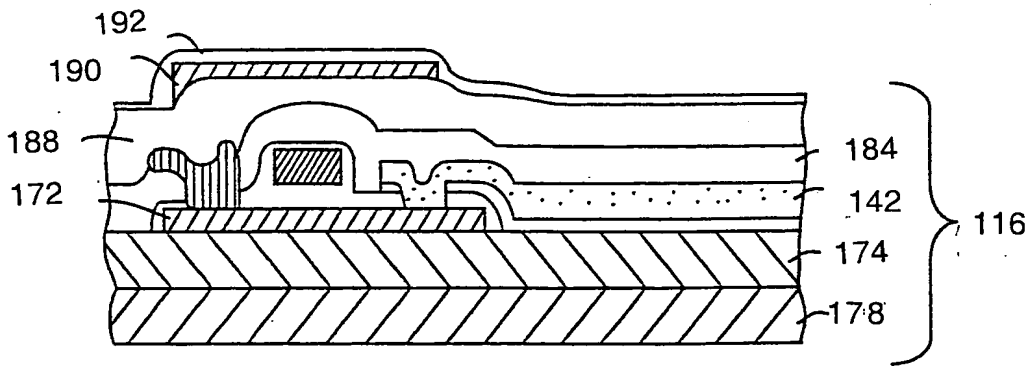


FIG. 5D

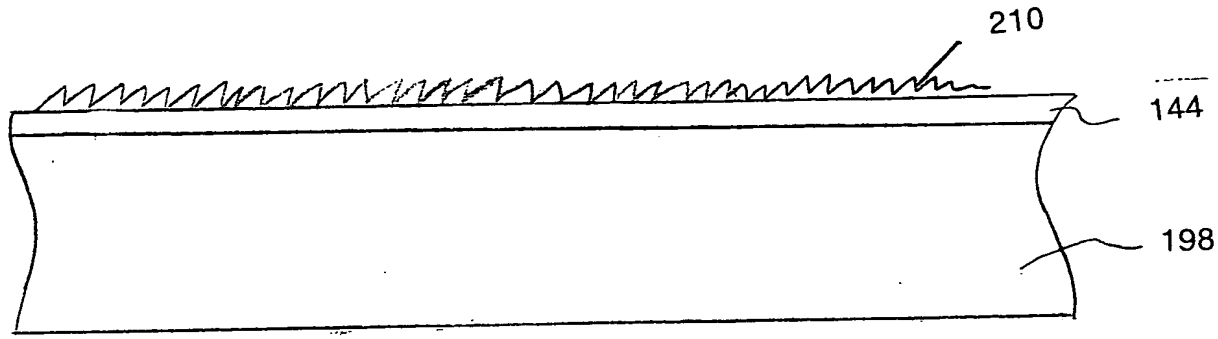


FIG. 6

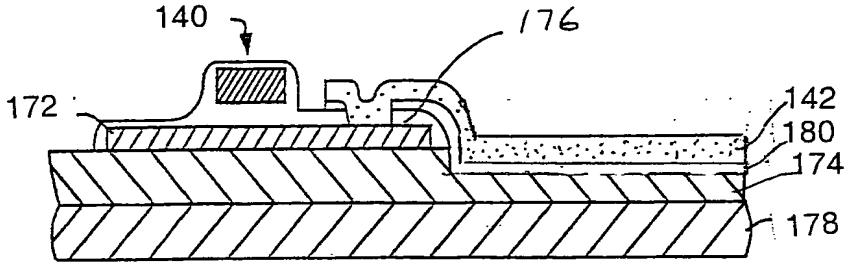


FIG. 7B

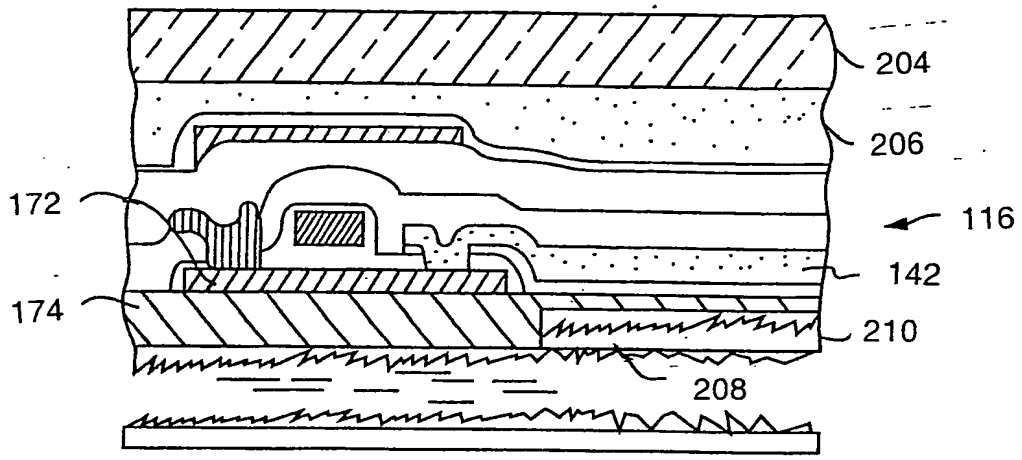


FIG. 7A

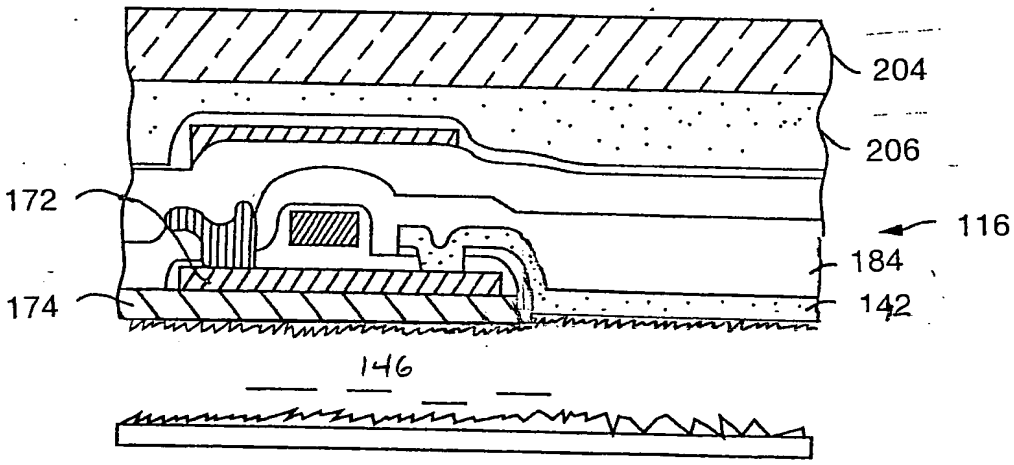
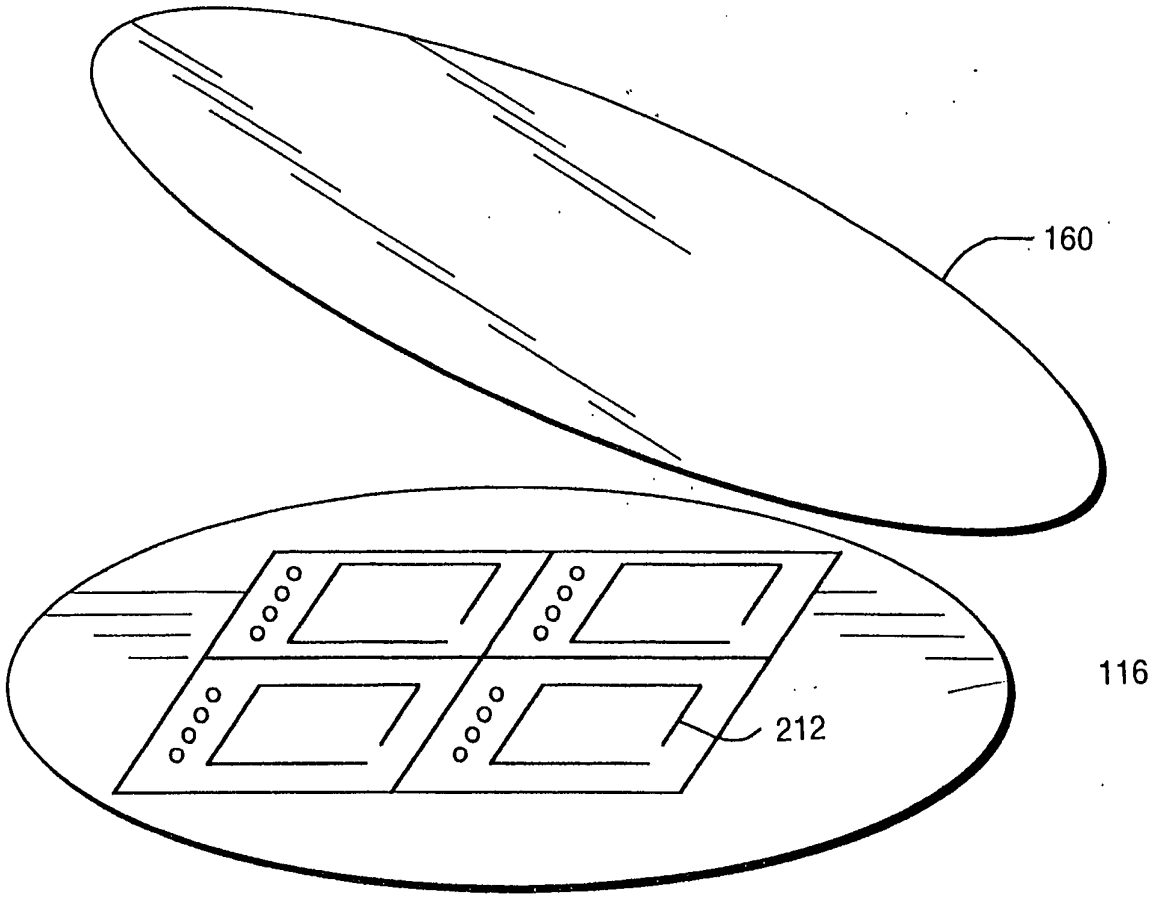


FIG. 7C

FIG. 8



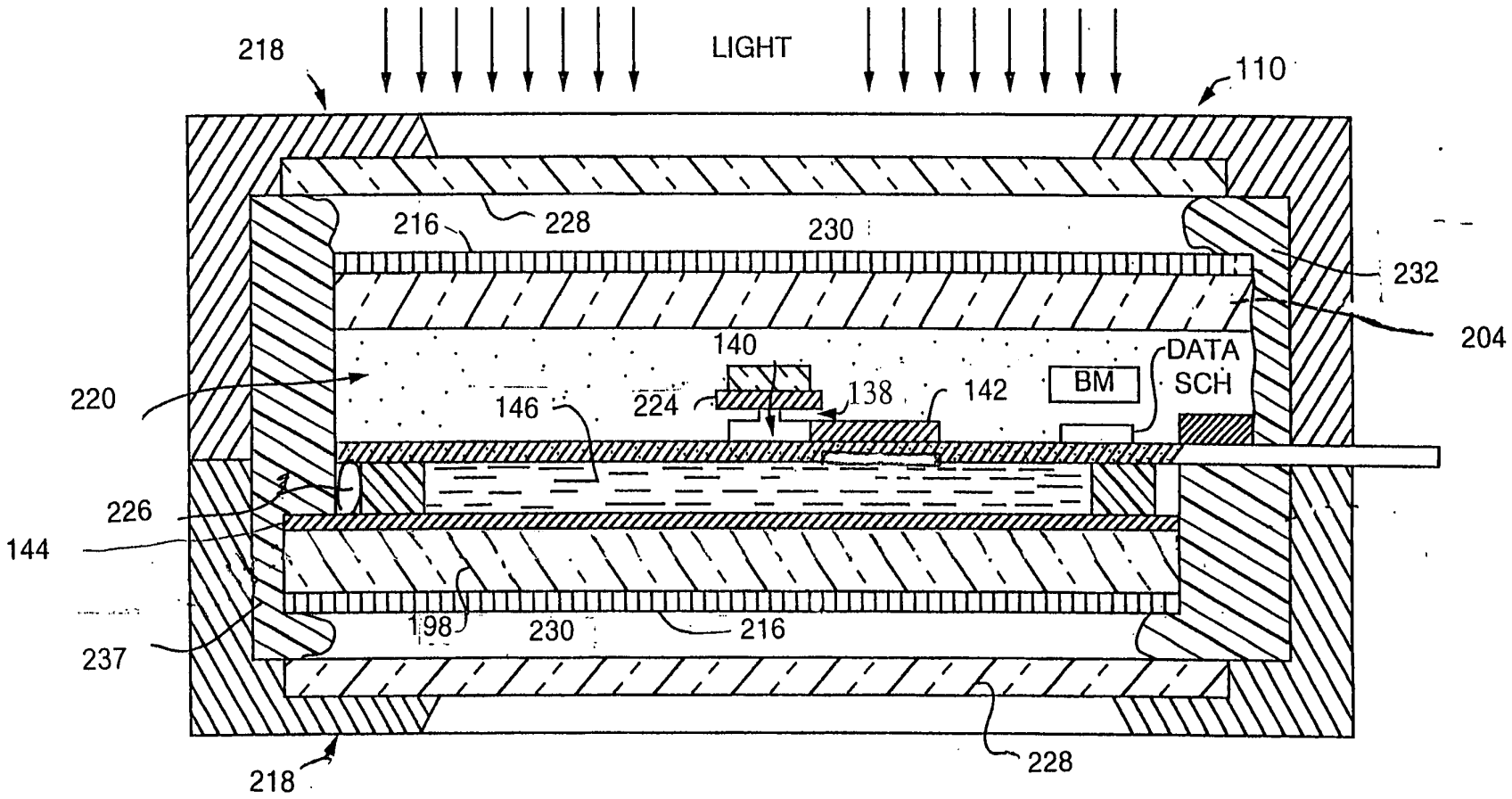

218
LIGHT
110
216
228
230
232
204
140
DATA
SCH
220
146
224
138
142
BM
226
144
198
230
216
237
218
228

FIG. 9

SHEET 09/09/50

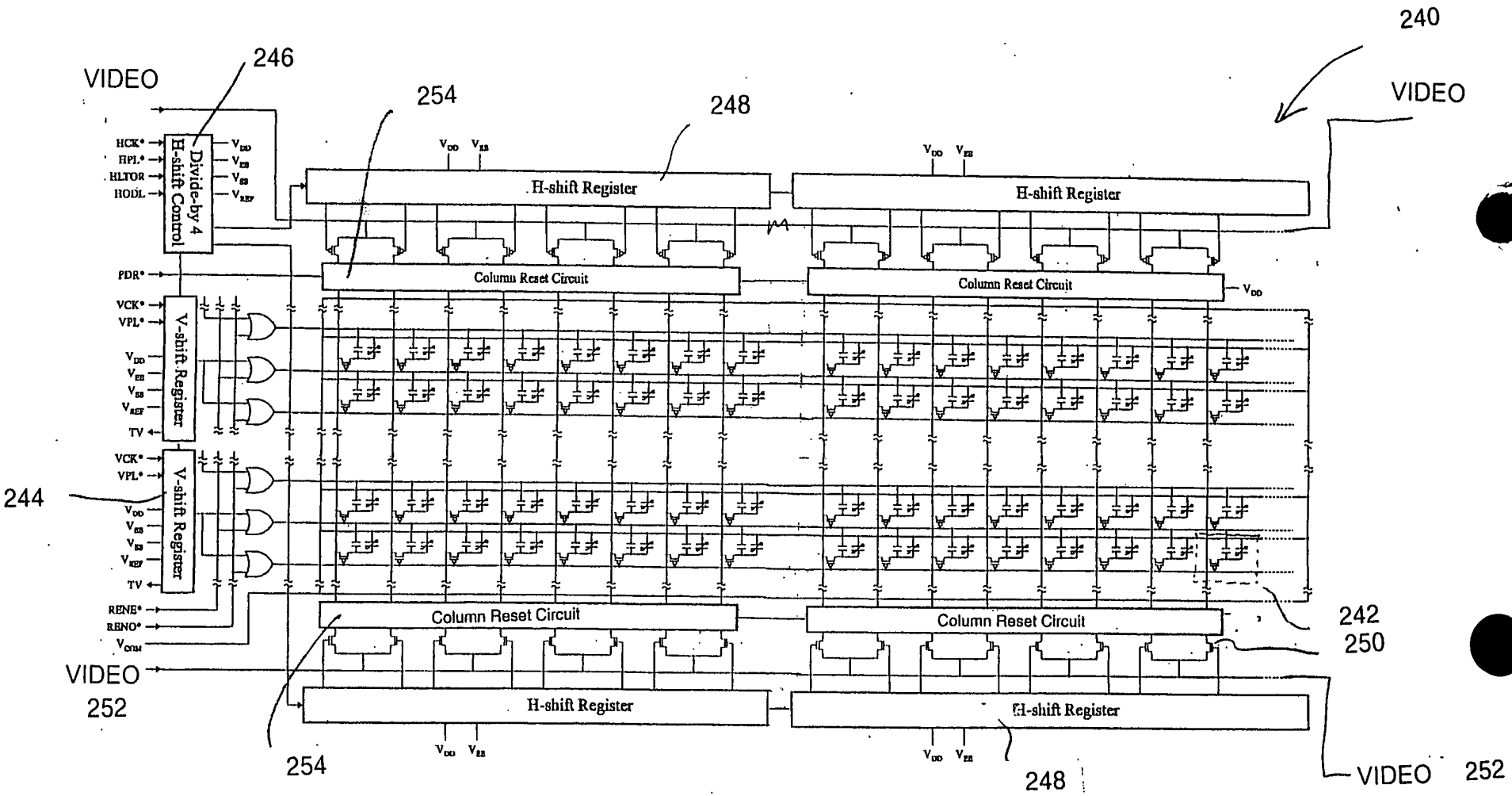
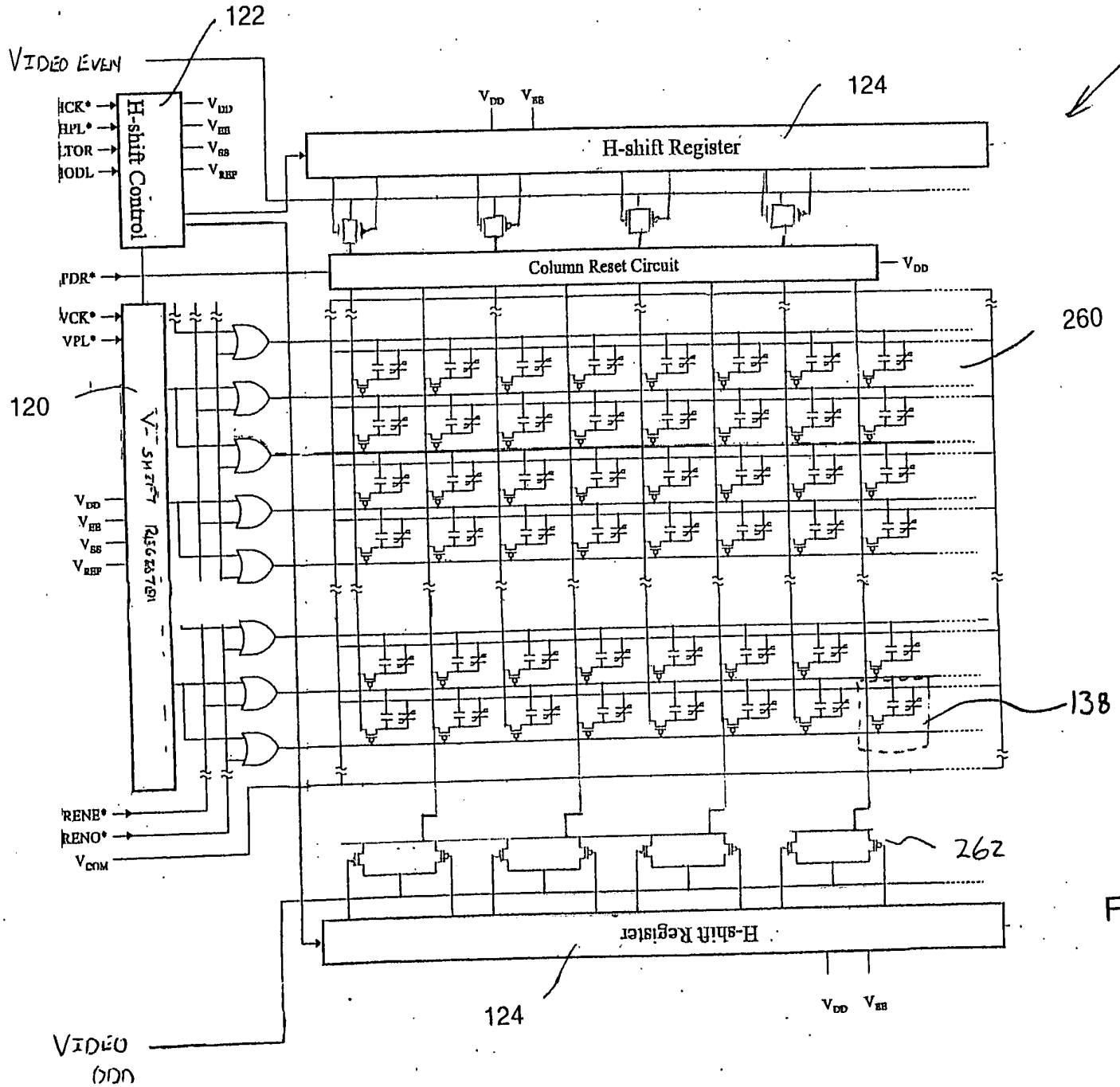


FIG. 10


122
VIDEO EVEN
H-shift Control
HCK*
HPL*
LTOR
HODL
V_{DD}
V_{EE}
V_{SS}
V_{REF}
124
H-shift Register
Column Reset Circuit
PDR*
VCK*
VPL*
120
V- Shift Register
RENE*
RENO*
V_{COM}
260
138
262
H-shift Register
124
VIDEO ODD

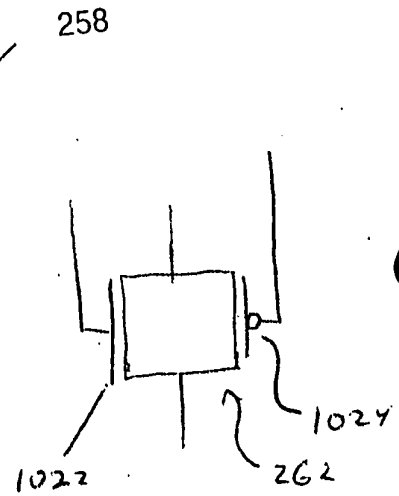

258
1024
1022
262

FIG. 11

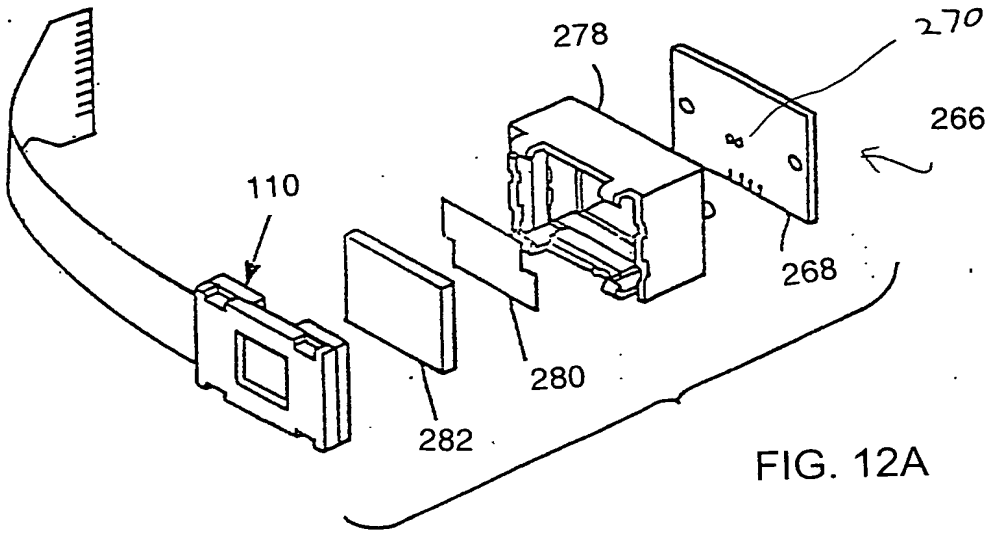


FIG. 12A

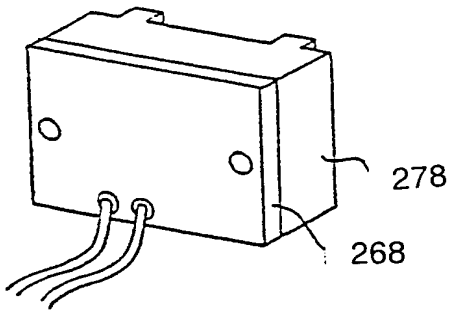


FIG. 12B

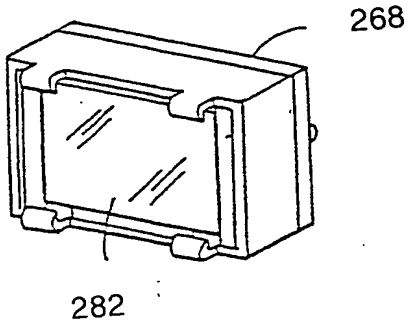


FIG. 12C

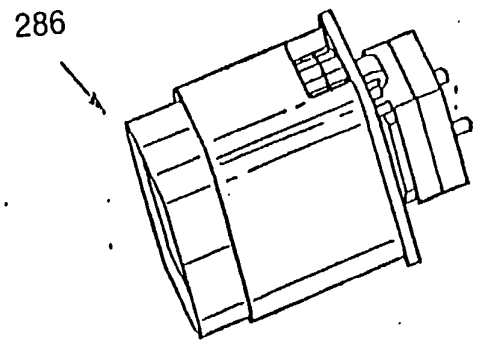


FIG. 13A

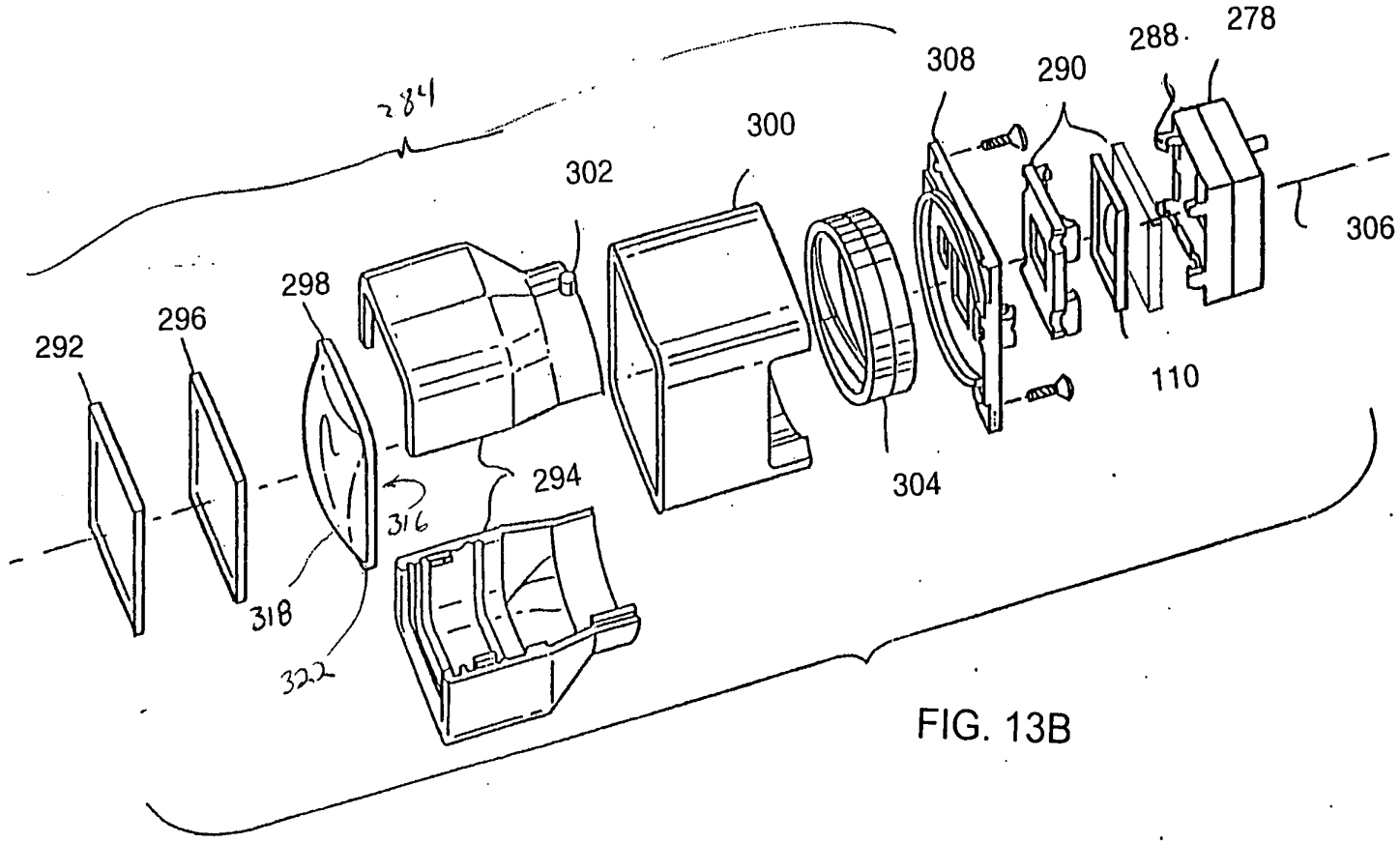


FIG. 13B

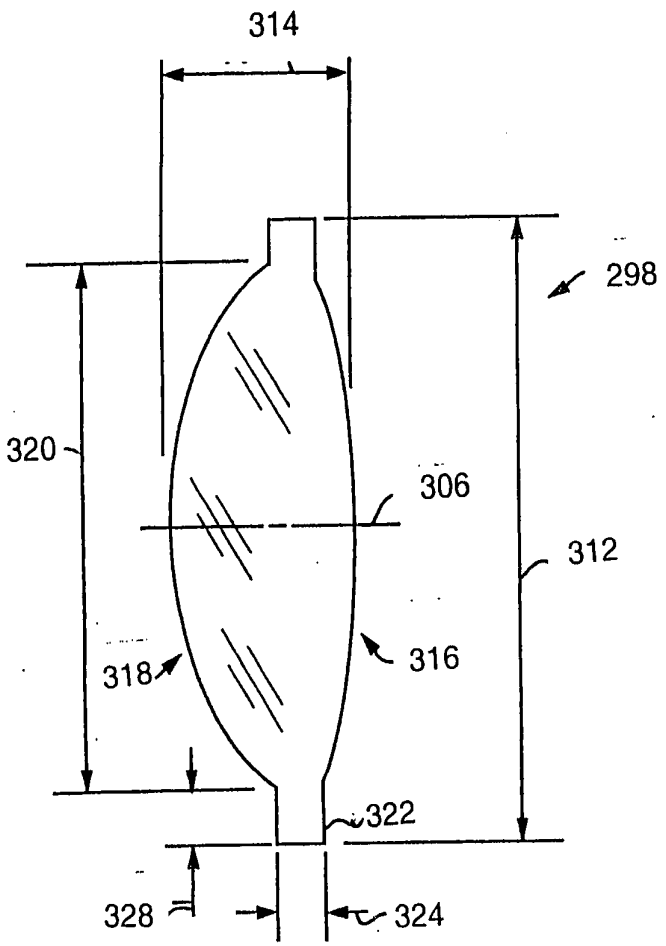


FIG. 14A

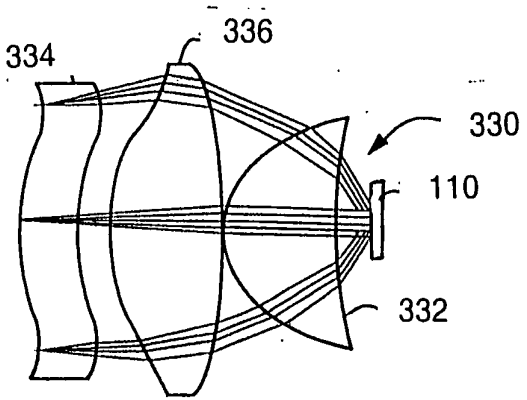


FIG. 14C

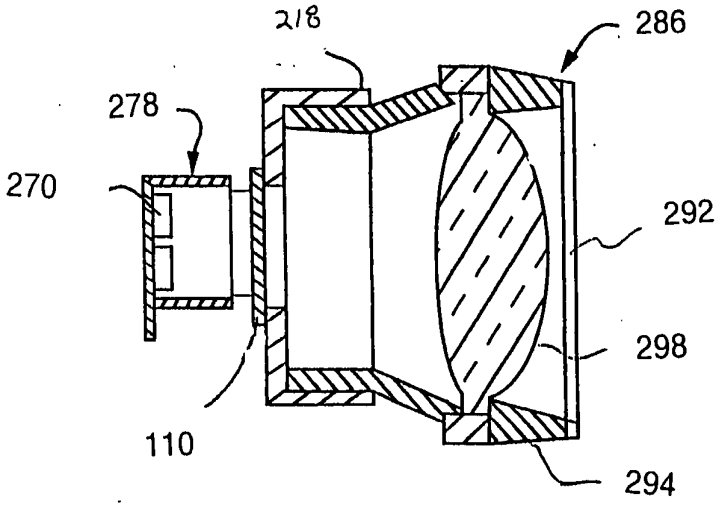


FIG. 14B

SHEET 09609460

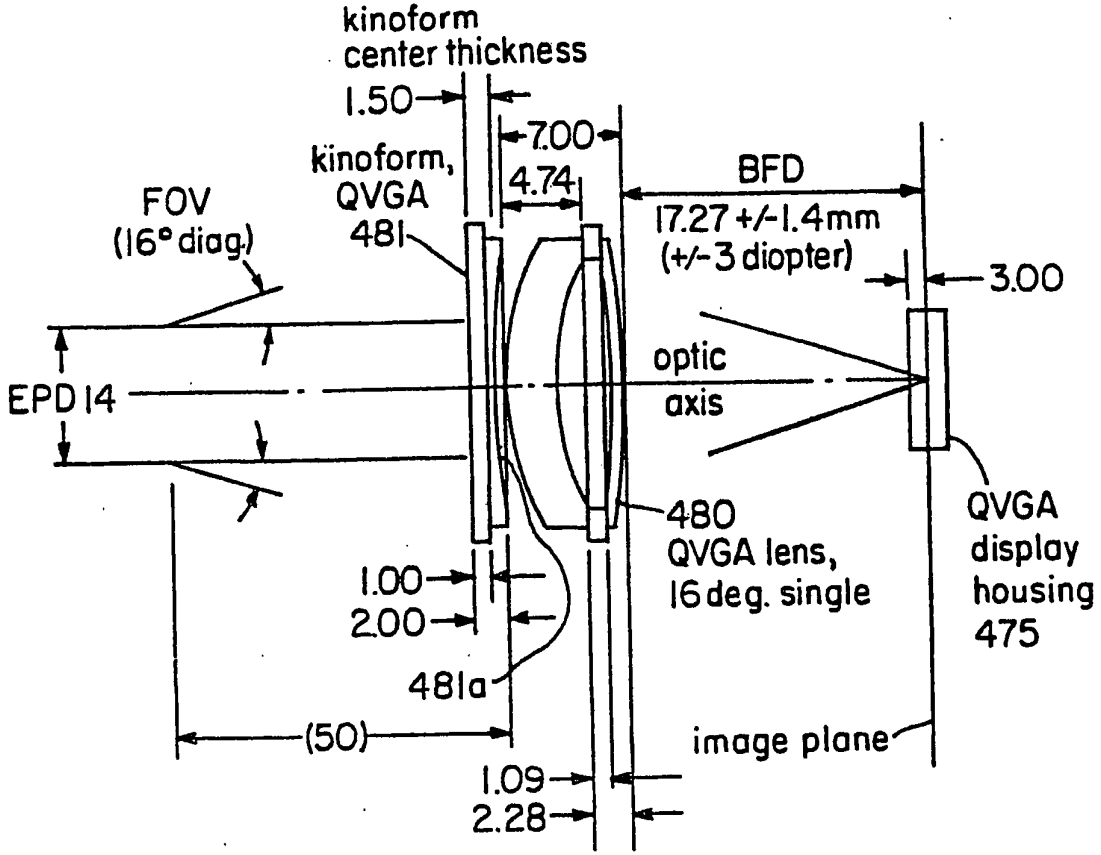


FIG. 15

SEARCH REPORT

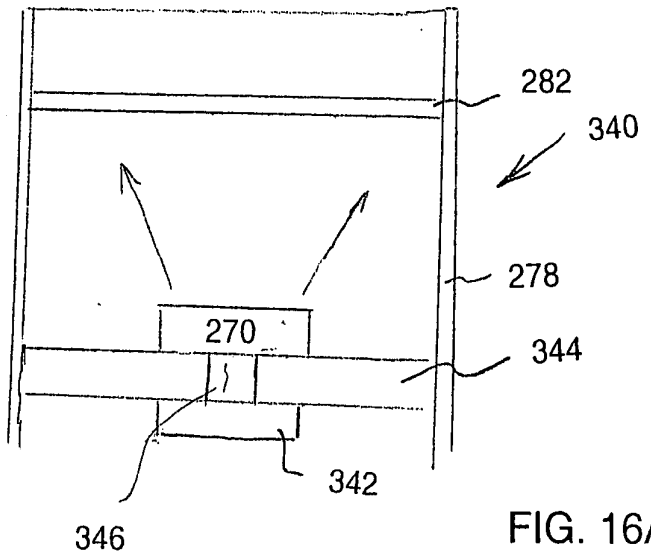


FIG. 16A

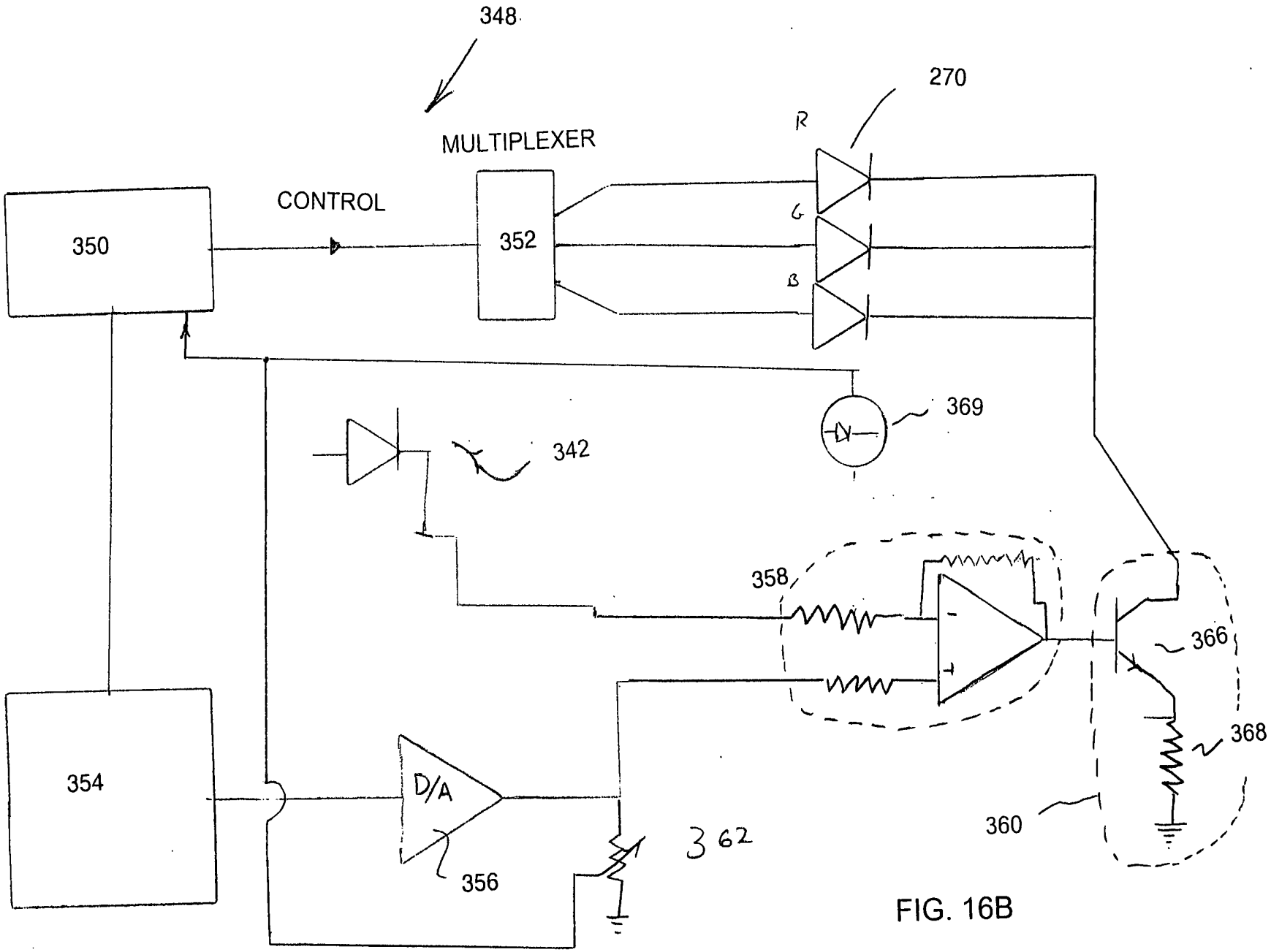

348
MULTIPLEXER
270
R
G
B
CONTROL
350
352
369
342
358
366
368
360
354
D/A
356
362

FIG. 16B

FIG. 17

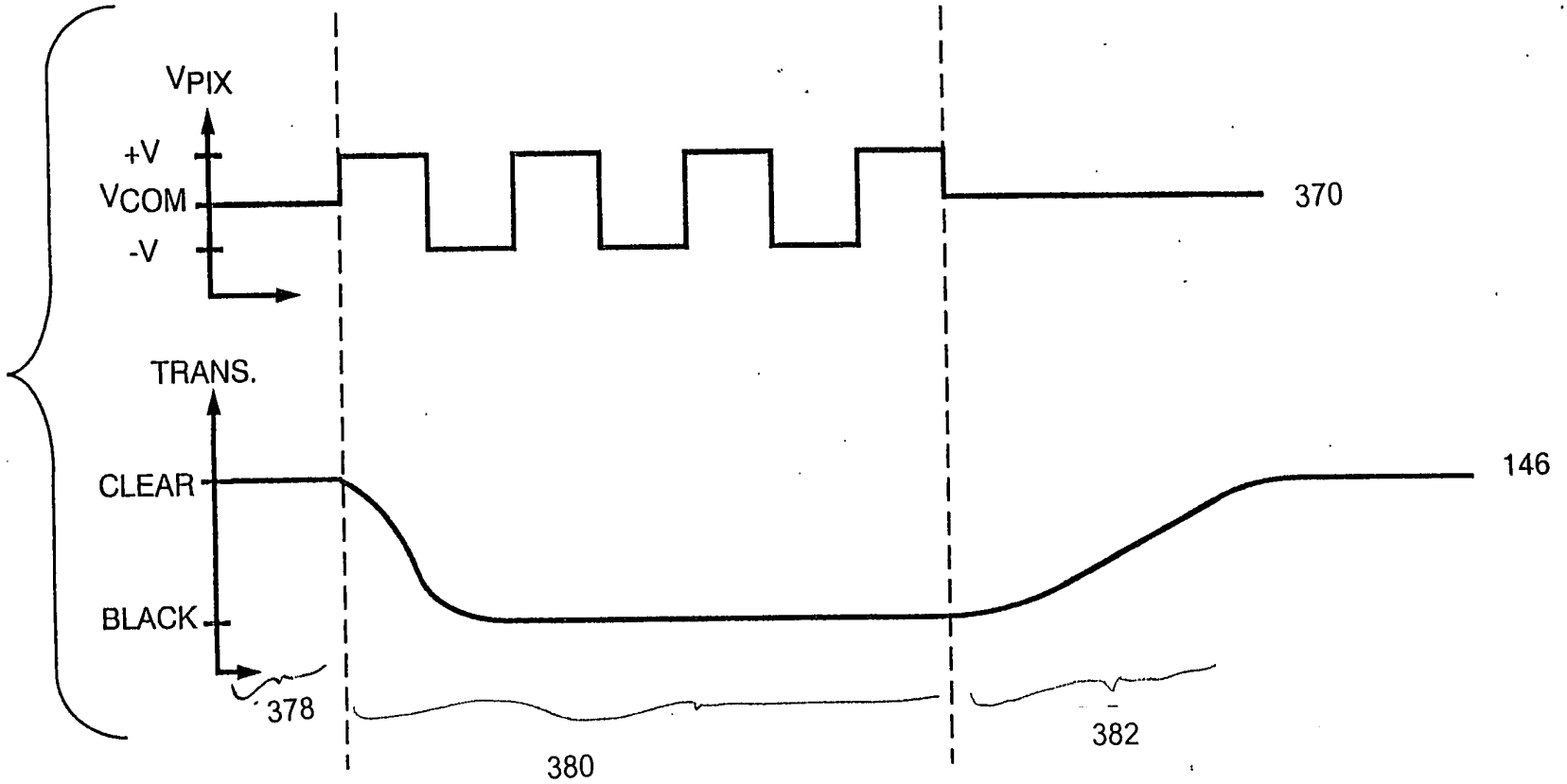
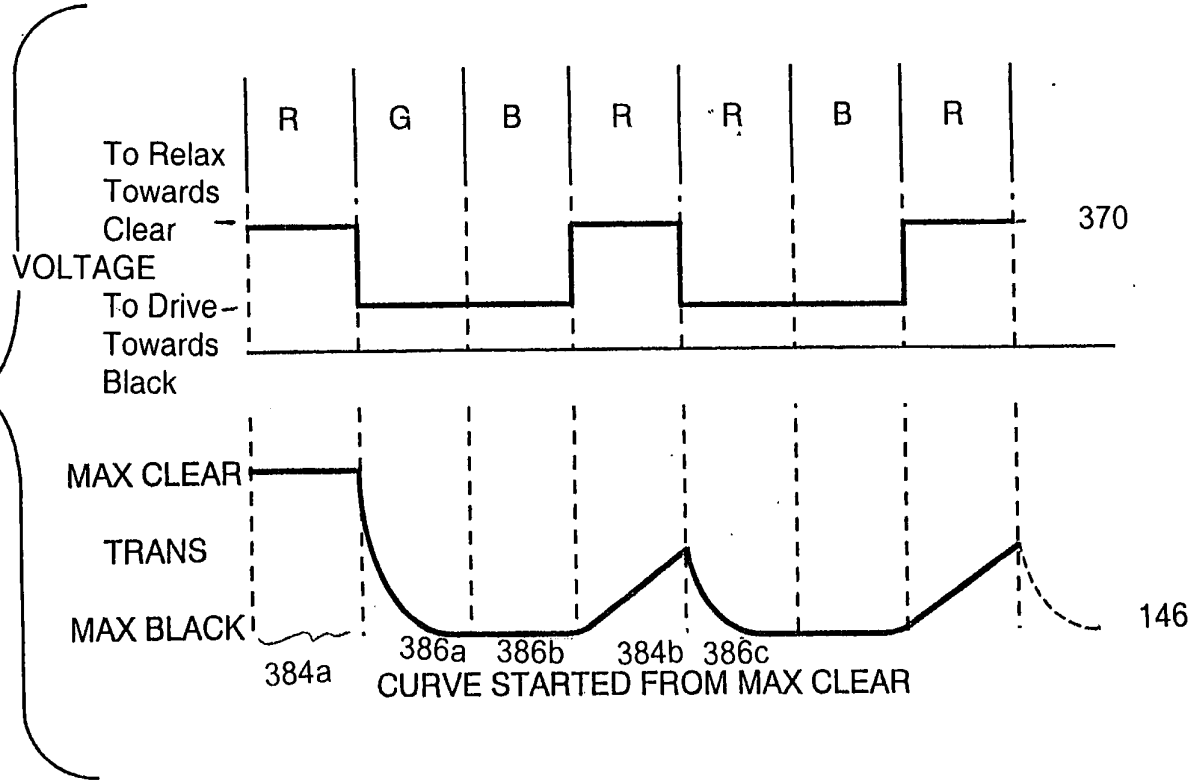


FIG. 18A


R
G
B
R
R
B
R
To Relax Towards Clear
VOLTAGE
To Drive Towards Black
370
MAX CLEAR
TRANS
MAX BLACK
146
384a
386a
386b
384b
386c
CURVE STARTED FROM MAX CLEAR

SGATZT"09609A:SG

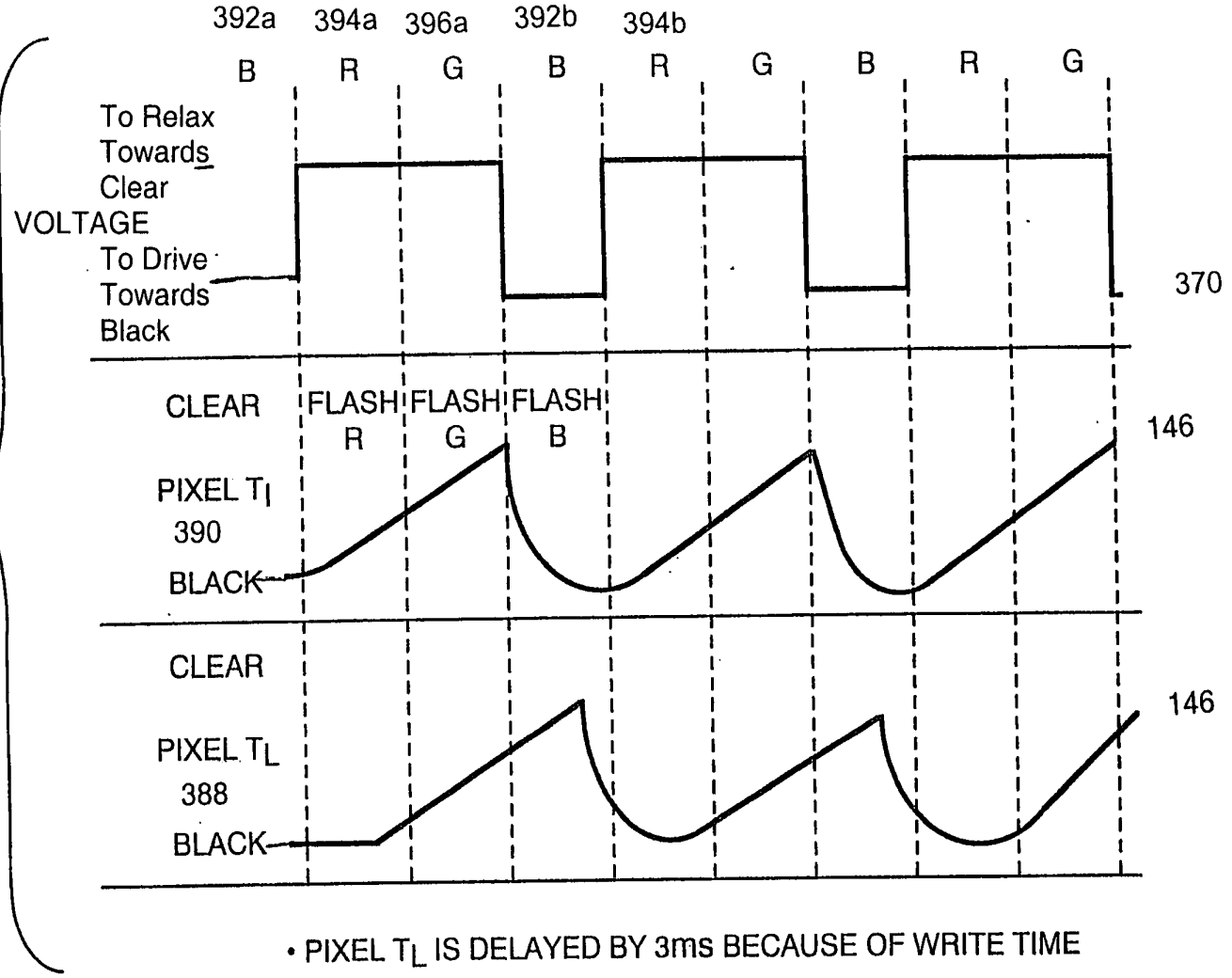


FIG. 18B

SEARCH 09609460

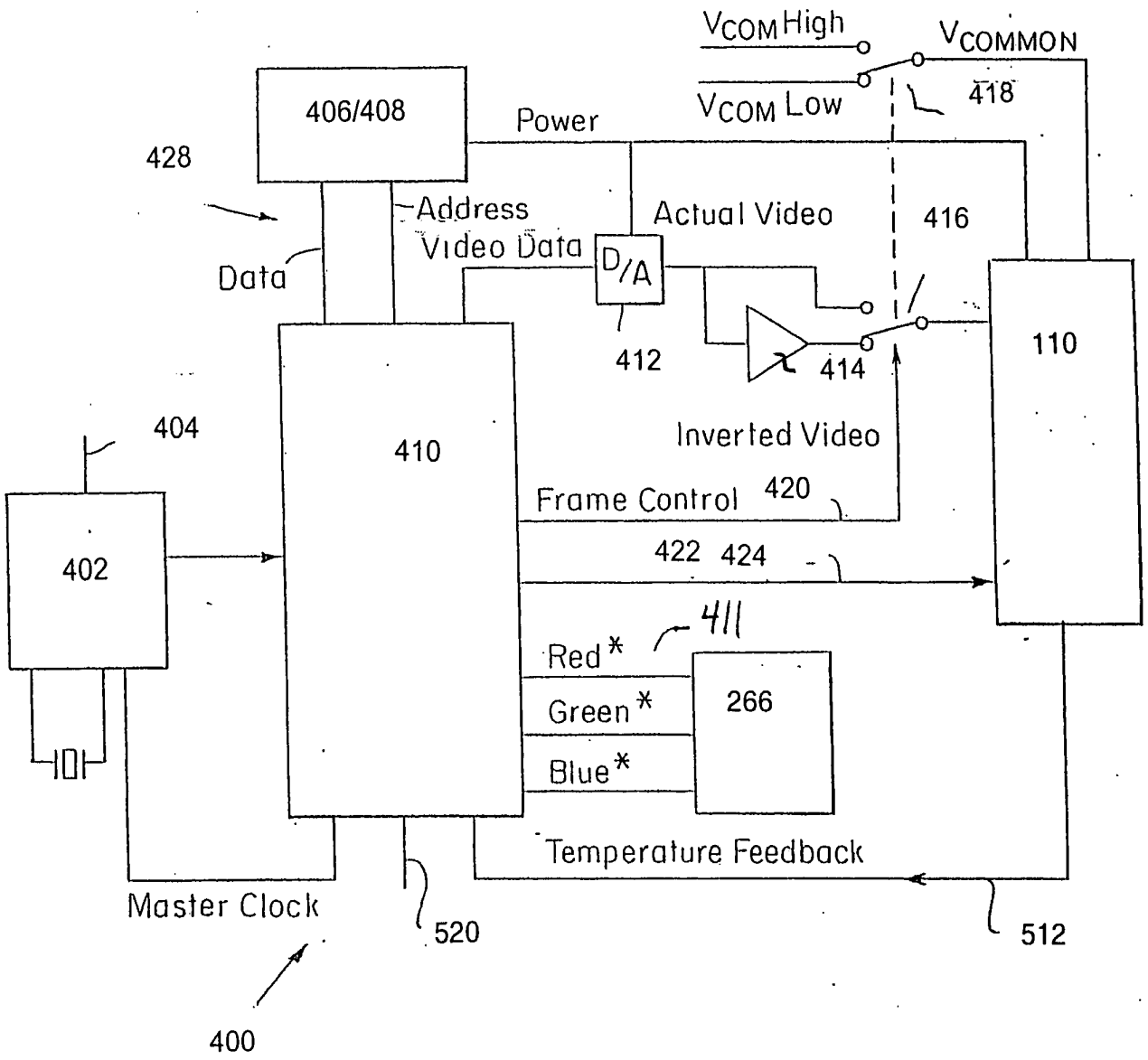


FIG. 19A

SEARCH 09609458

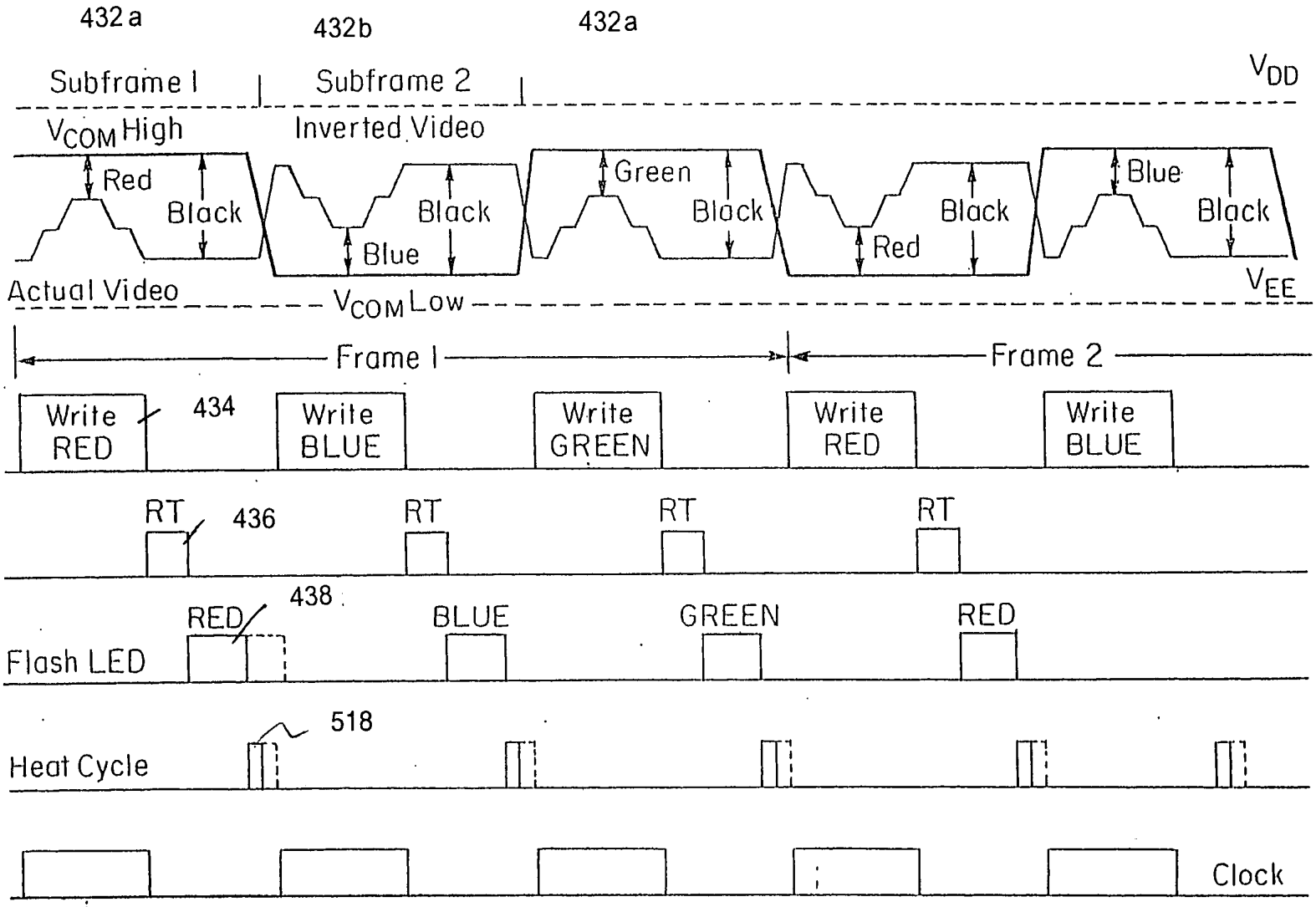


FIG. 19B

66T2T 09509460

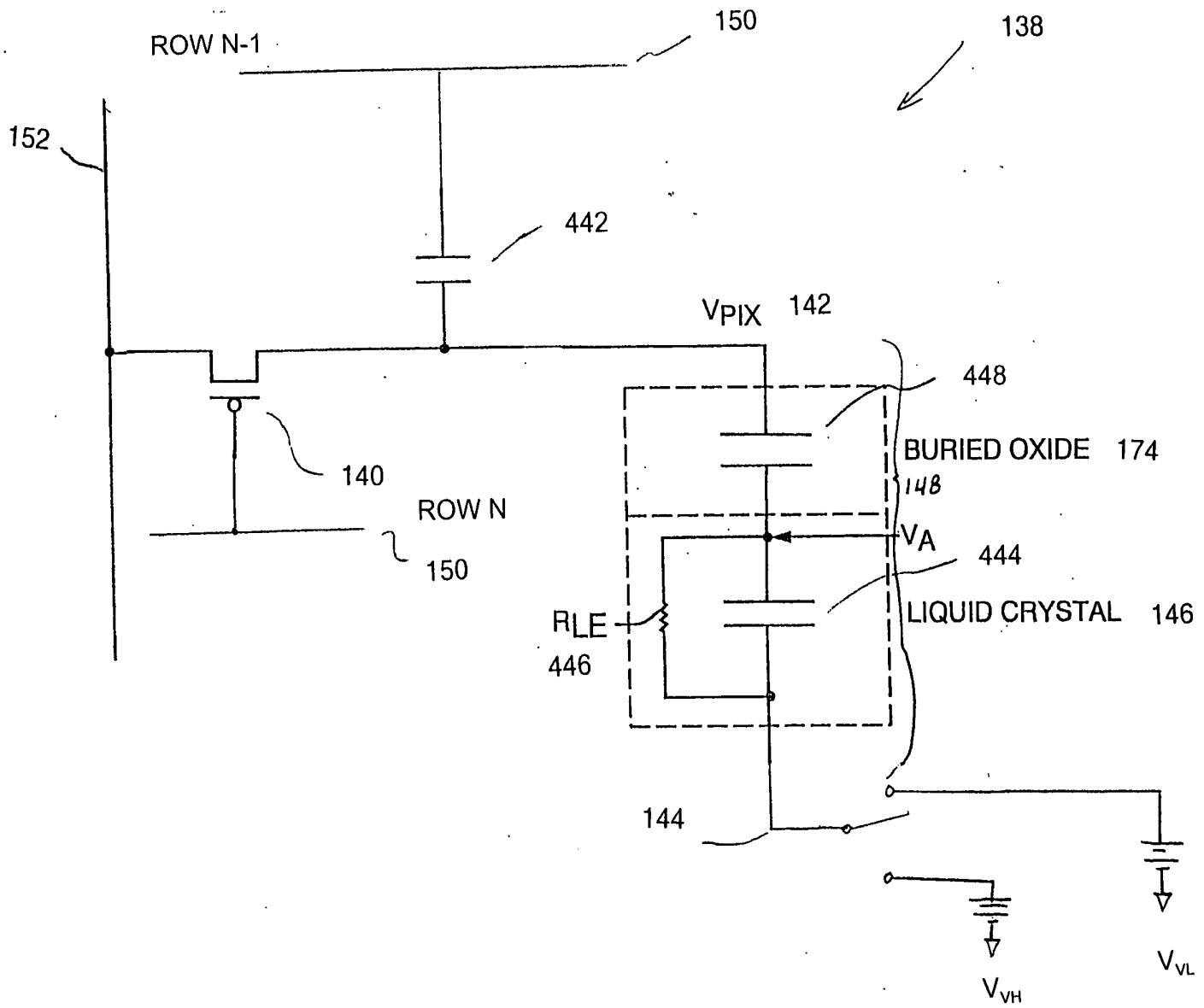


FIG. 20A

SHEET 09509460

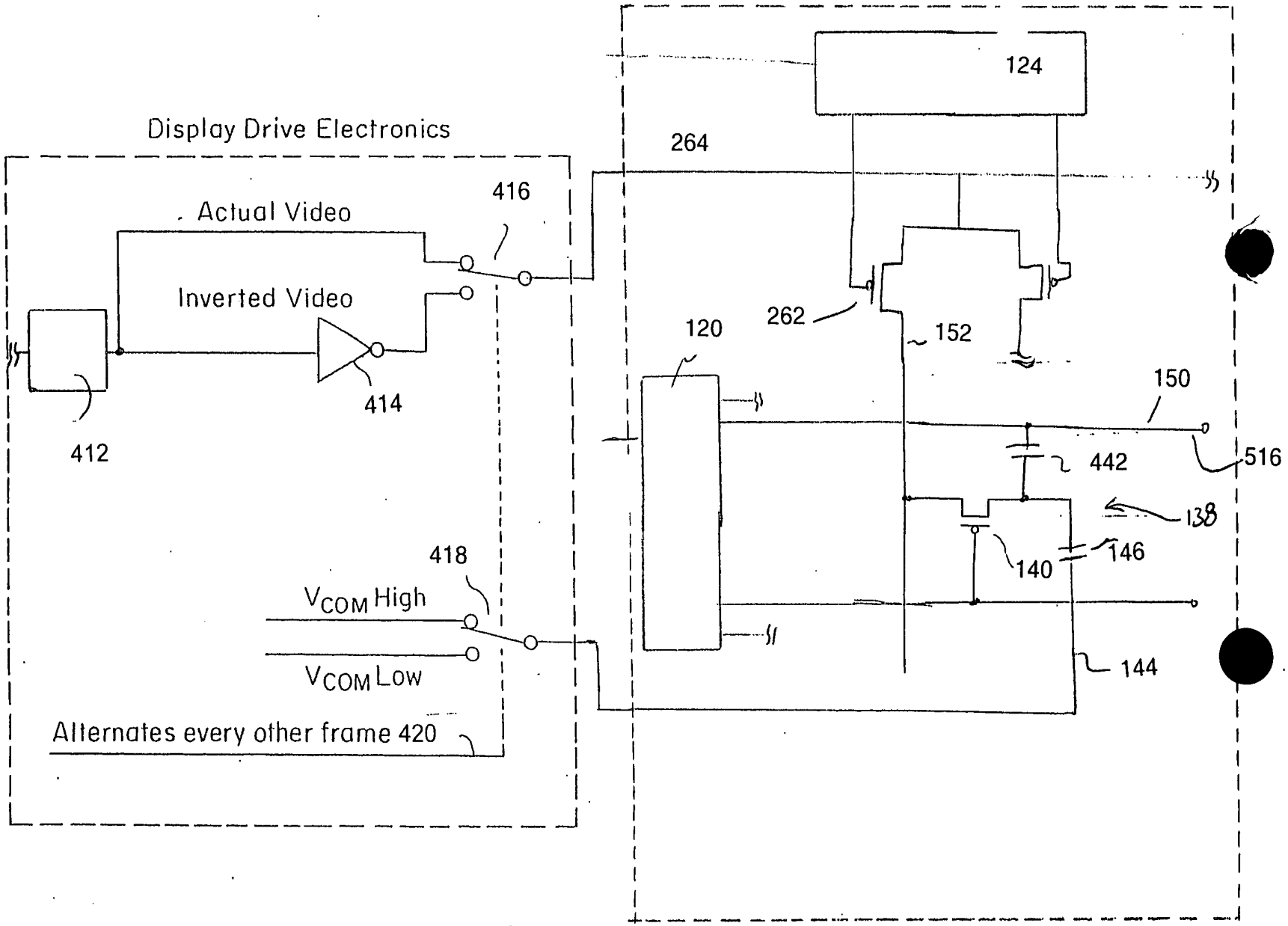
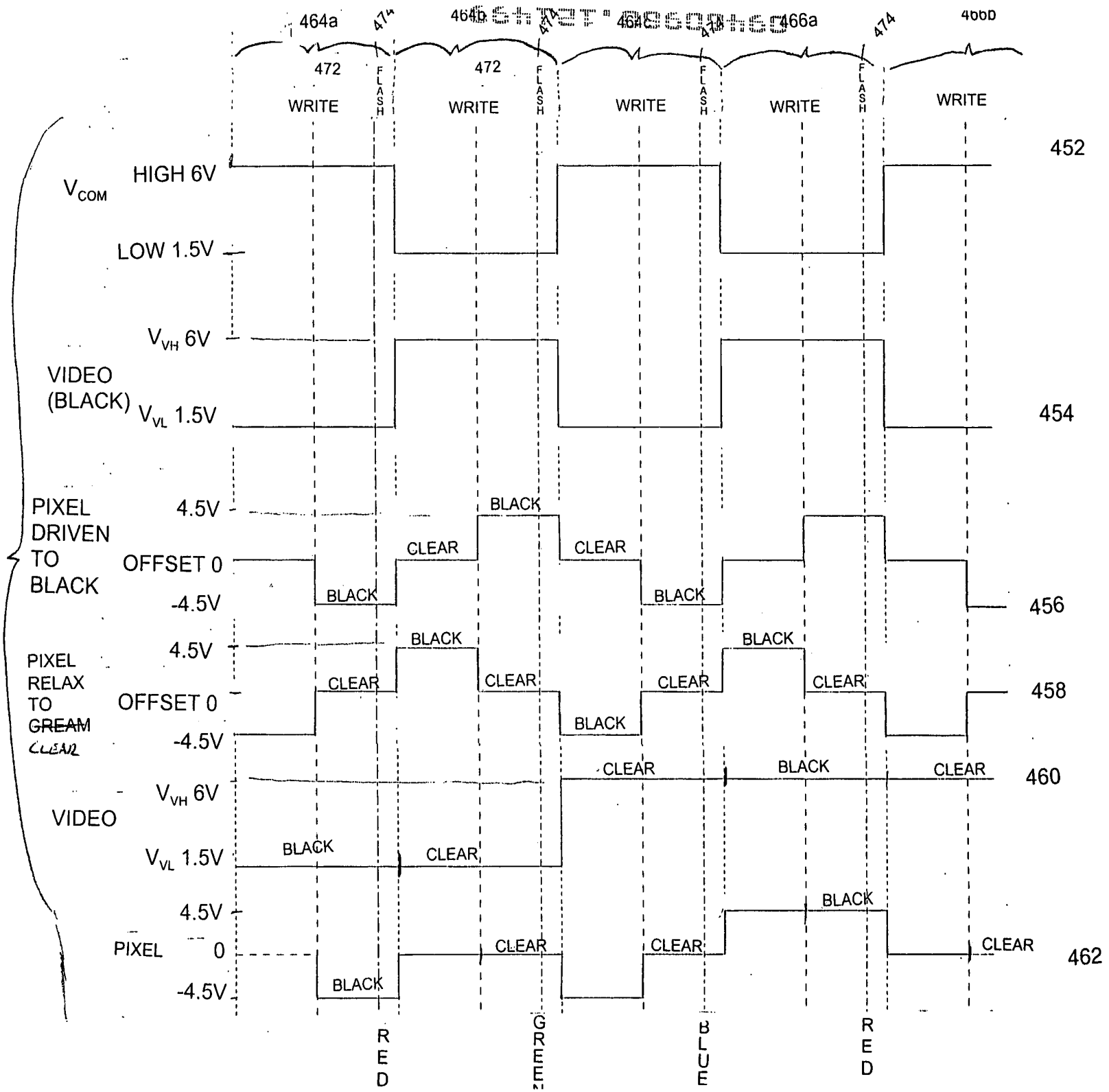


FIG. 20B

FIG. 21


464a
474
464b
474
464c
474
466a
474
466b
472
FLASH
WRITE
V_{COM}
HIGH 6V
LOW 1.5V
452
V_{VH} 6V
VIDEO (BLACK)
V_{VL} 1.5V
454
PIXEL DRIVEN TO BLACK
4.5V
OFFSET 0
-4.5V
BLACK
CLEAR
456
PIXEL RELAX TO GREAM CLEAR
458
VIDEO
460
PIXEL
462
RED
GREEN
BLUE
RED

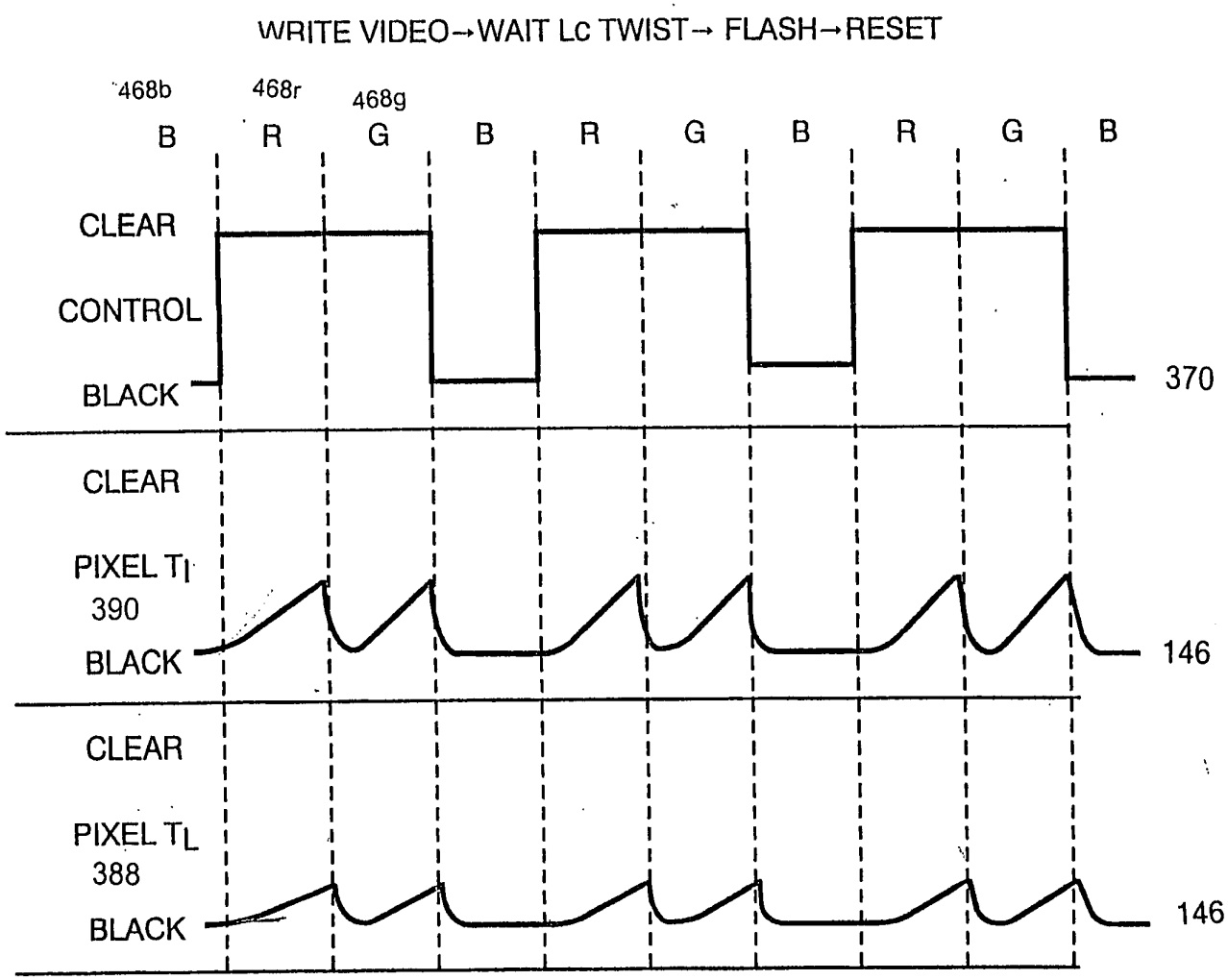

WRITE VIDEO→WAIT Lc TWIST→ FLASH→RESET
468b
468r
468g
B
R
G
B
R
G
B
R
G
B
CLEAR
CONTROL
BLACK
370
CLEAR
PIXEL TI
390
BLACK
146
CLEAR
PIXEL TL
388
BLACK
146

FIG. 22

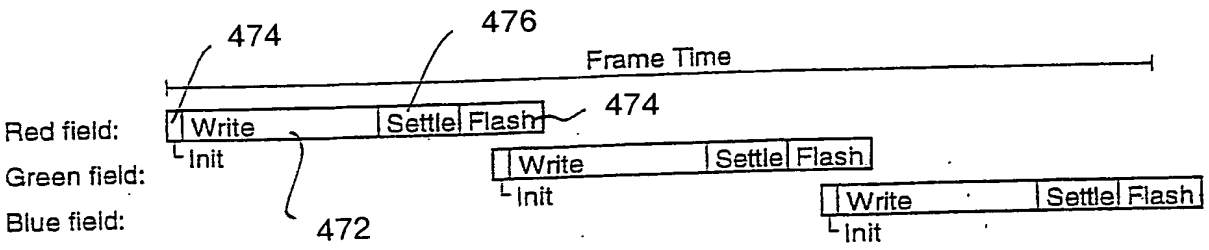


FIG. 23A

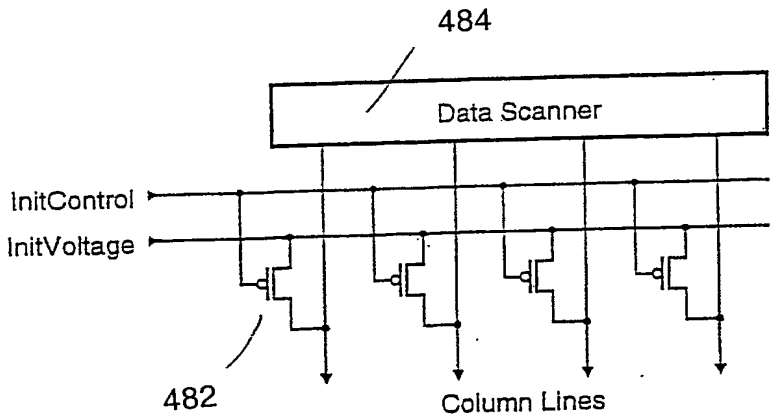
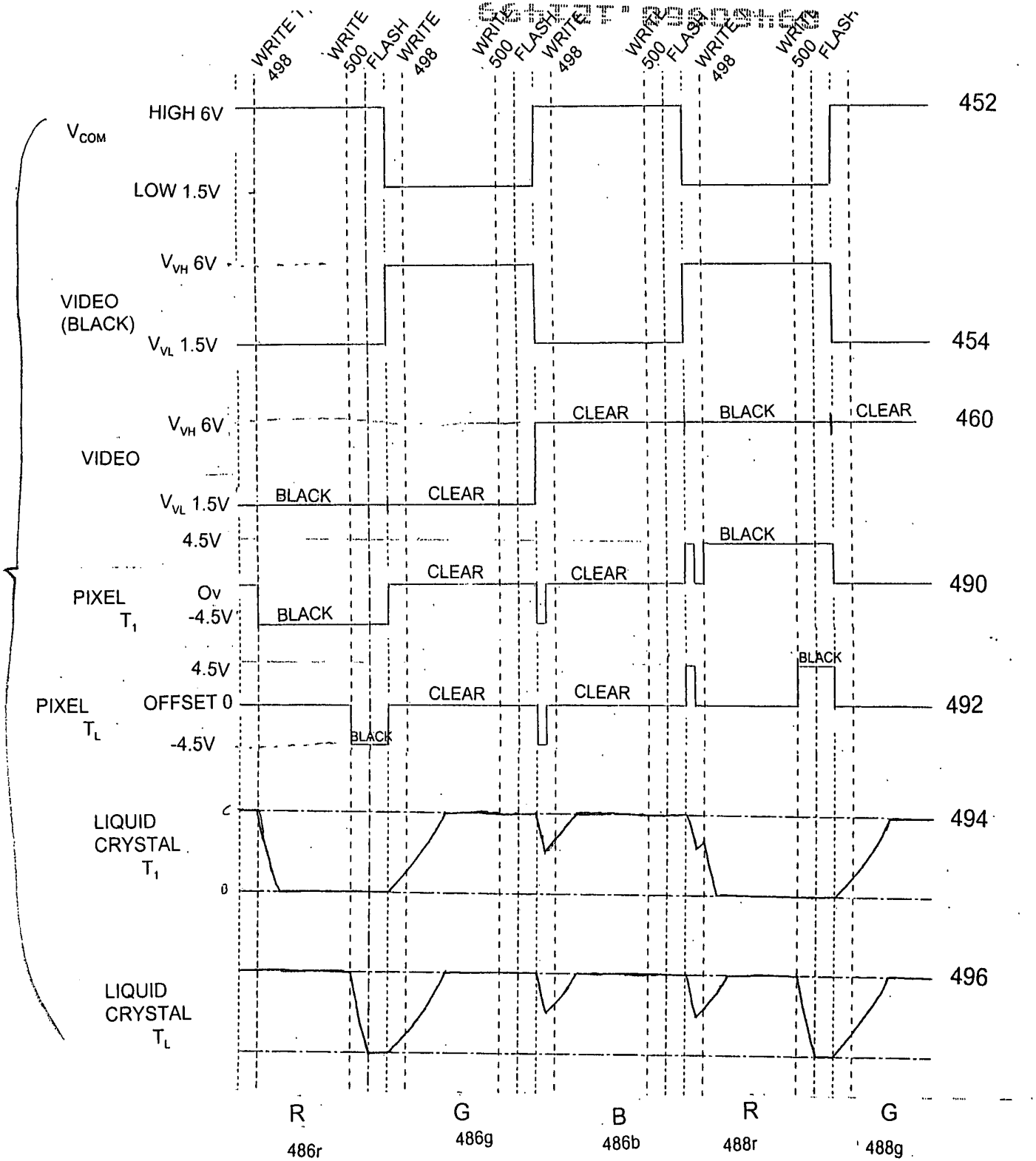


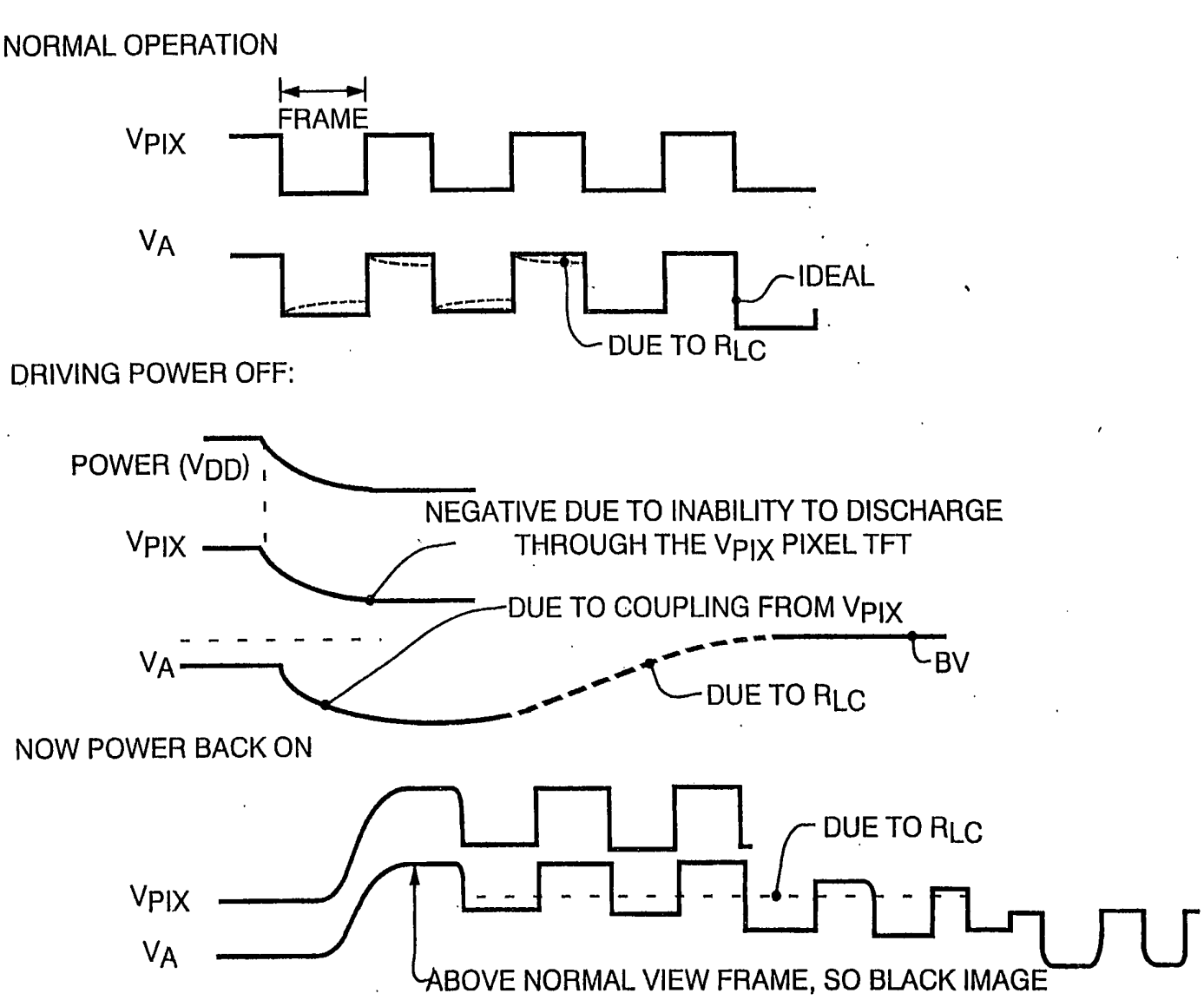
FIG. 23B

FIG. 23C


WRITE 498
WRITE 500
FLASH
WRITE 498
WRITE 500
FLASH
WRITE 498
WRITE 500
FLASH
WRITE 498
WRITE 500
FLASH
V_{COM}
HIGH 6V
LOW 1.5V
452
VIDEO (BLACK)
V_{VH} 6V
V_{VL} 1.5V
454
VIDEO
V_{VH} 6V
V_{VL} 1.5V
BLACK
CLEAR
CLEAR
BLACK
CLEAR
460
PIXEL T_1
4.5V
Ov
-4.5V
BLACK
CLEAR
CLEAR
BLACK
490
PIXEL T_L
4.5V
OFFSET 0
-4.5V
BLACK
CLEAR
CLEAR
BLACK
492
LIQUID CRYSTAL T_1
494
LIQUID CRYSTAL T_L
496
R
486r
G
486g
B
486b
R
488r
G
488g

Sheet 9609:60

FIG. 24



SHEET 09609450

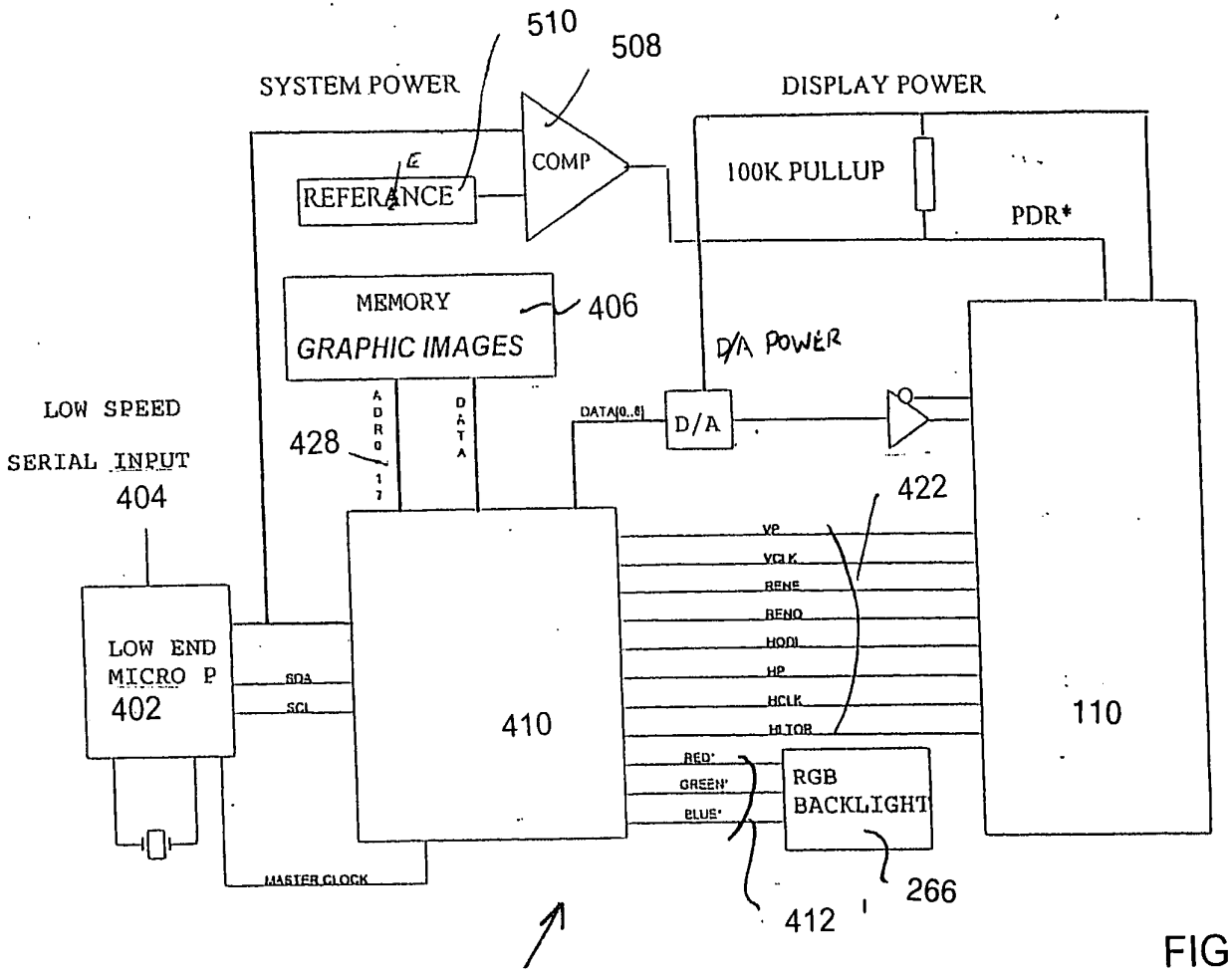


FIG. 25

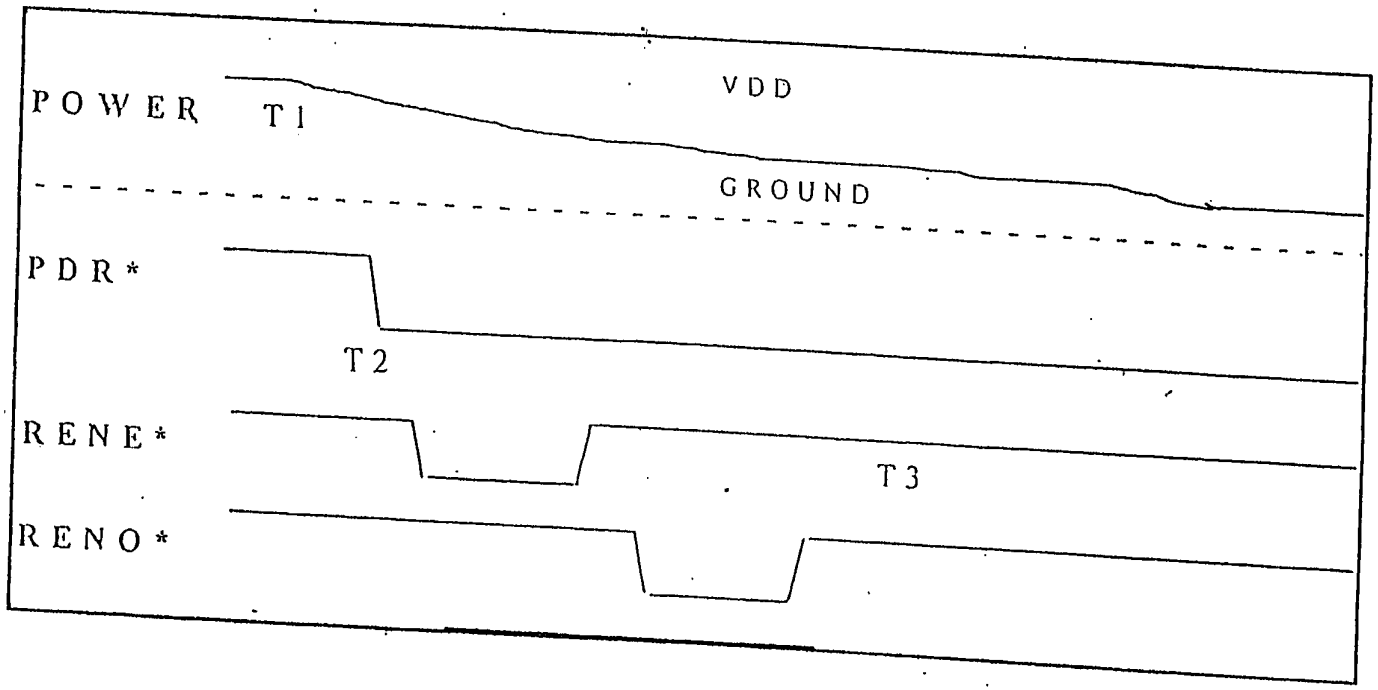


FIG. 26

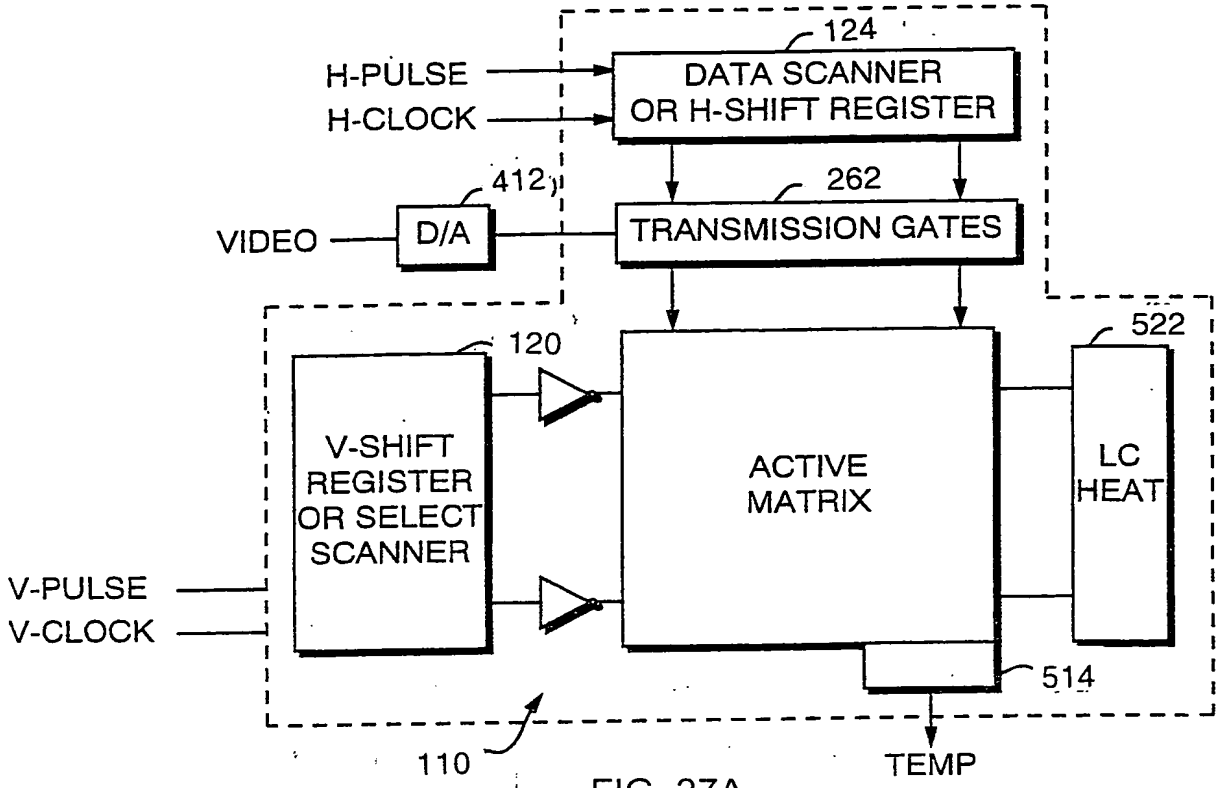


FIG. 27A

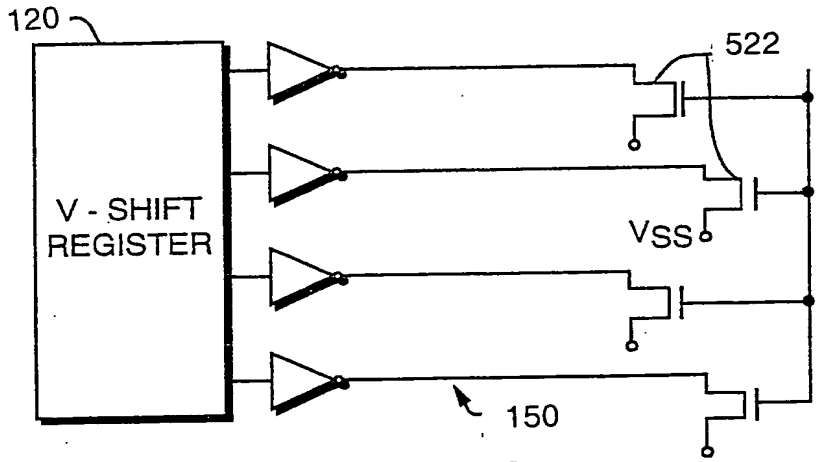


FIG. 27B

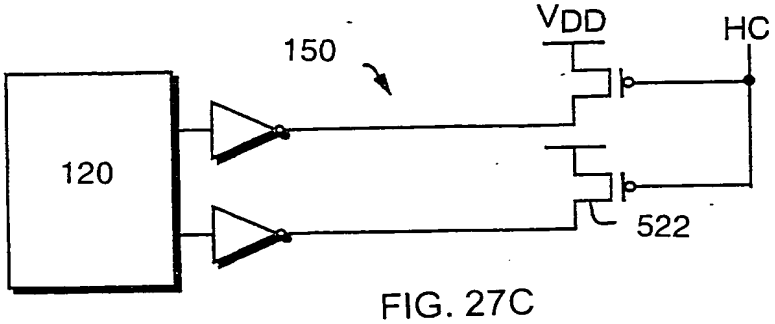


FIG. 27C

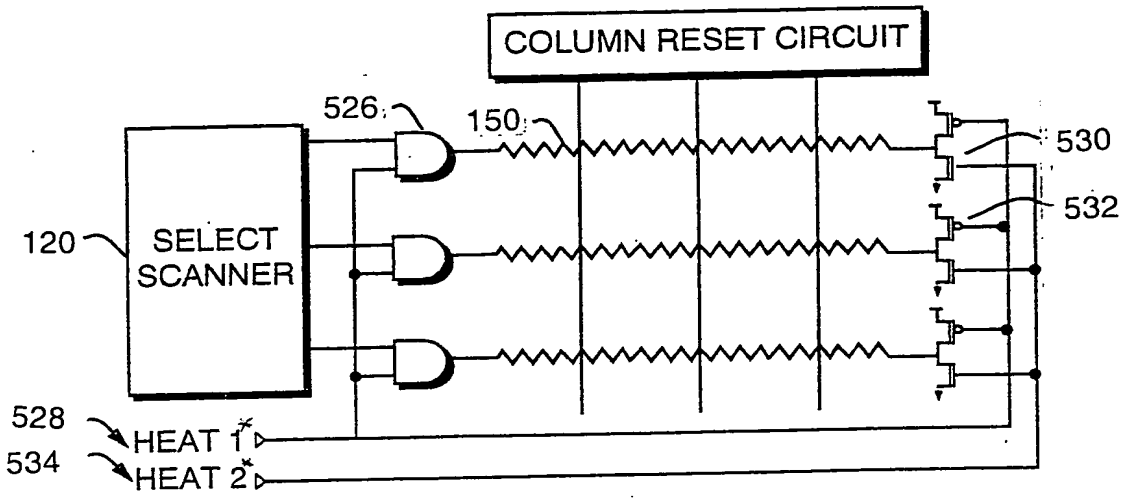


FIG. 27D

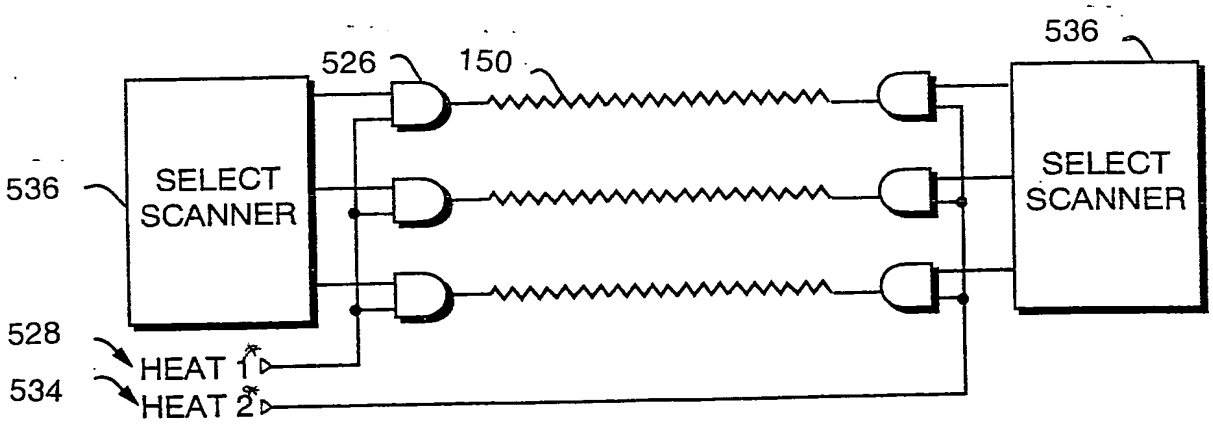


FIG. 27E

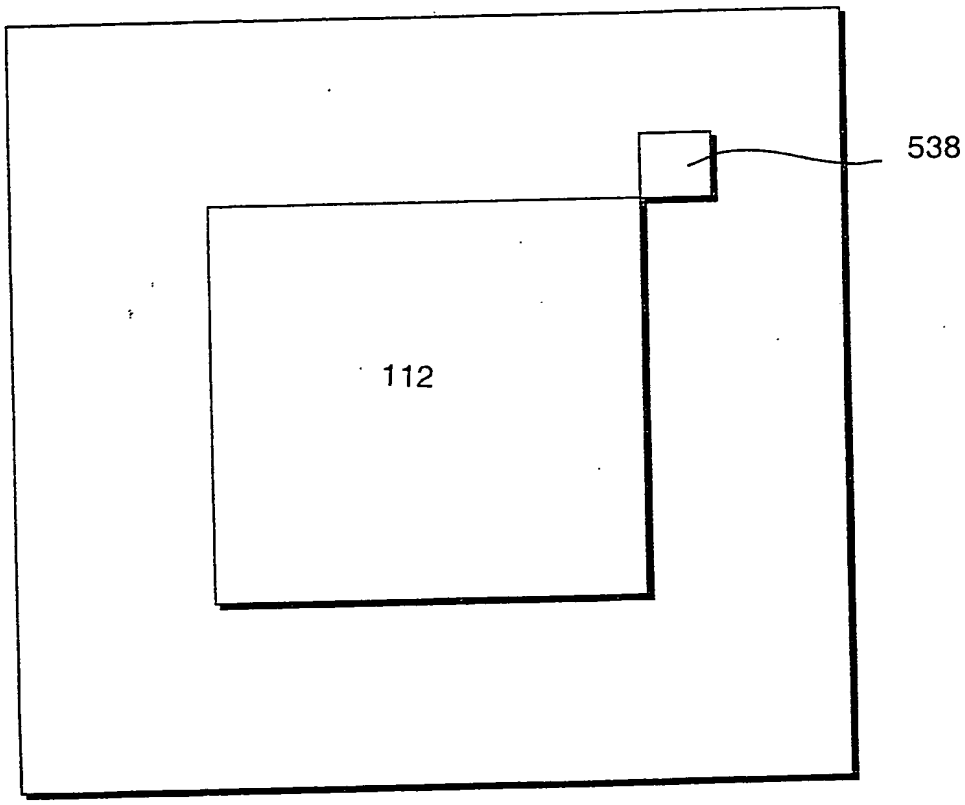


FIG. 27F

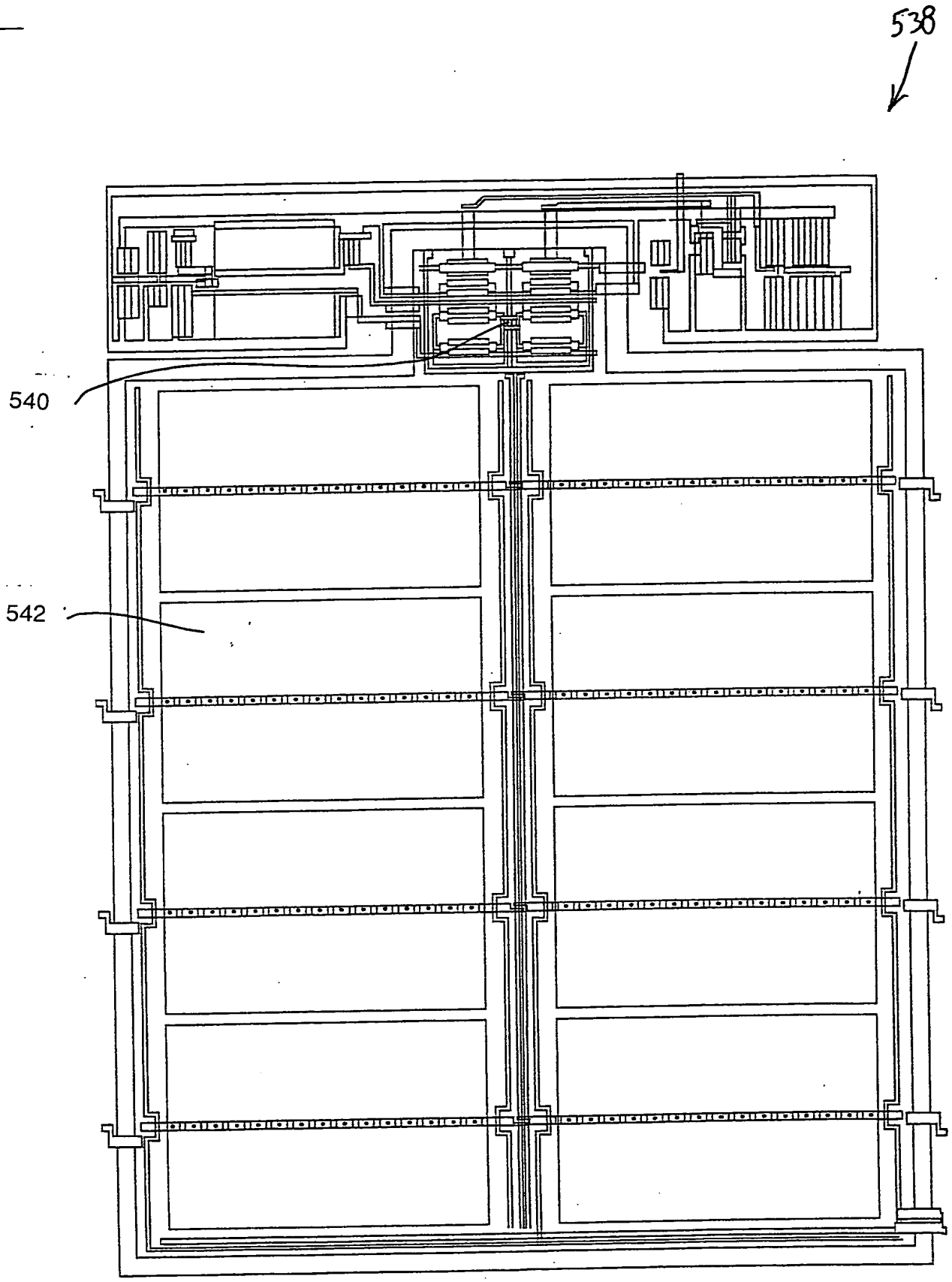


FIG. 27G

6647127 99609460

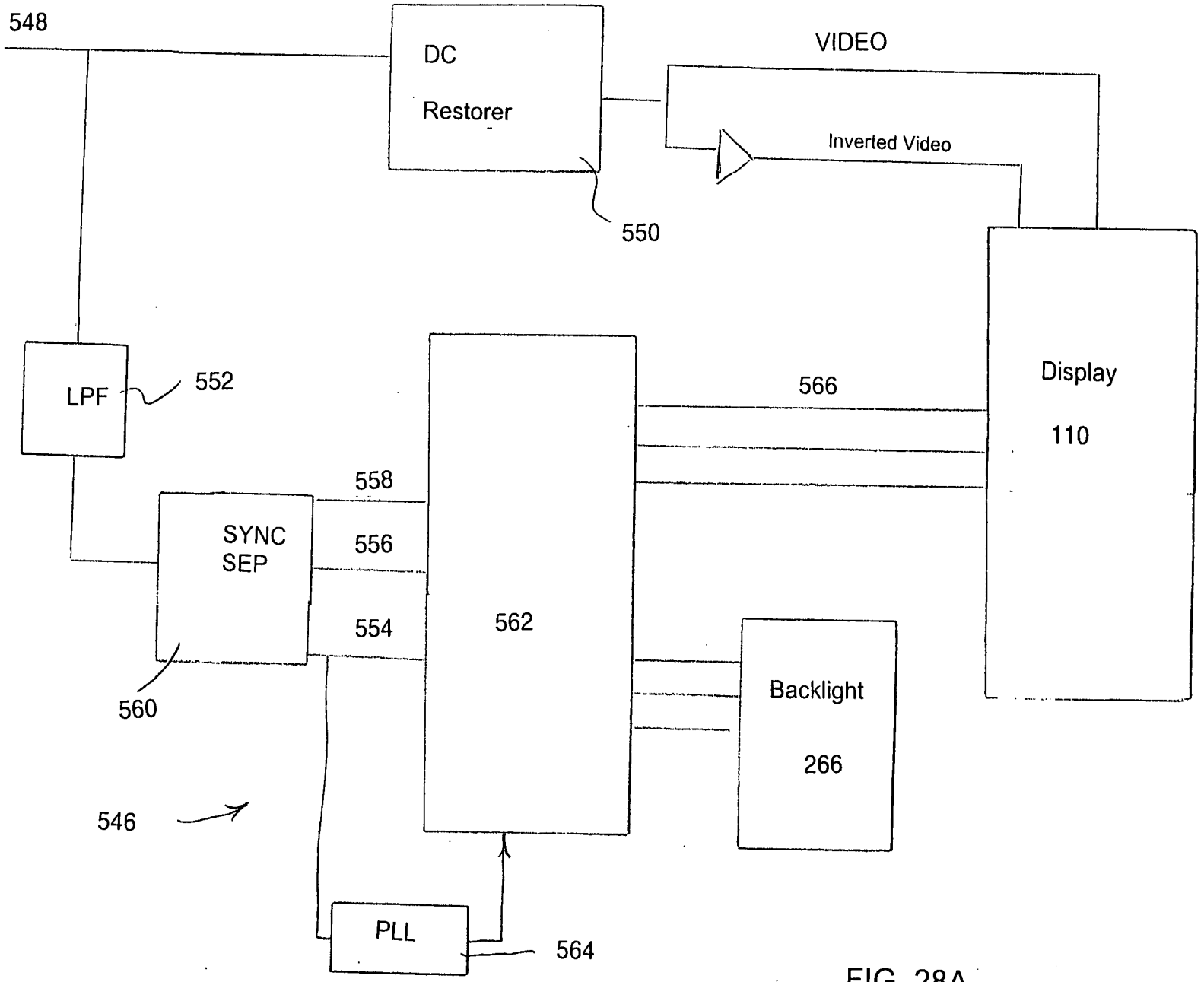


FIG. 28A

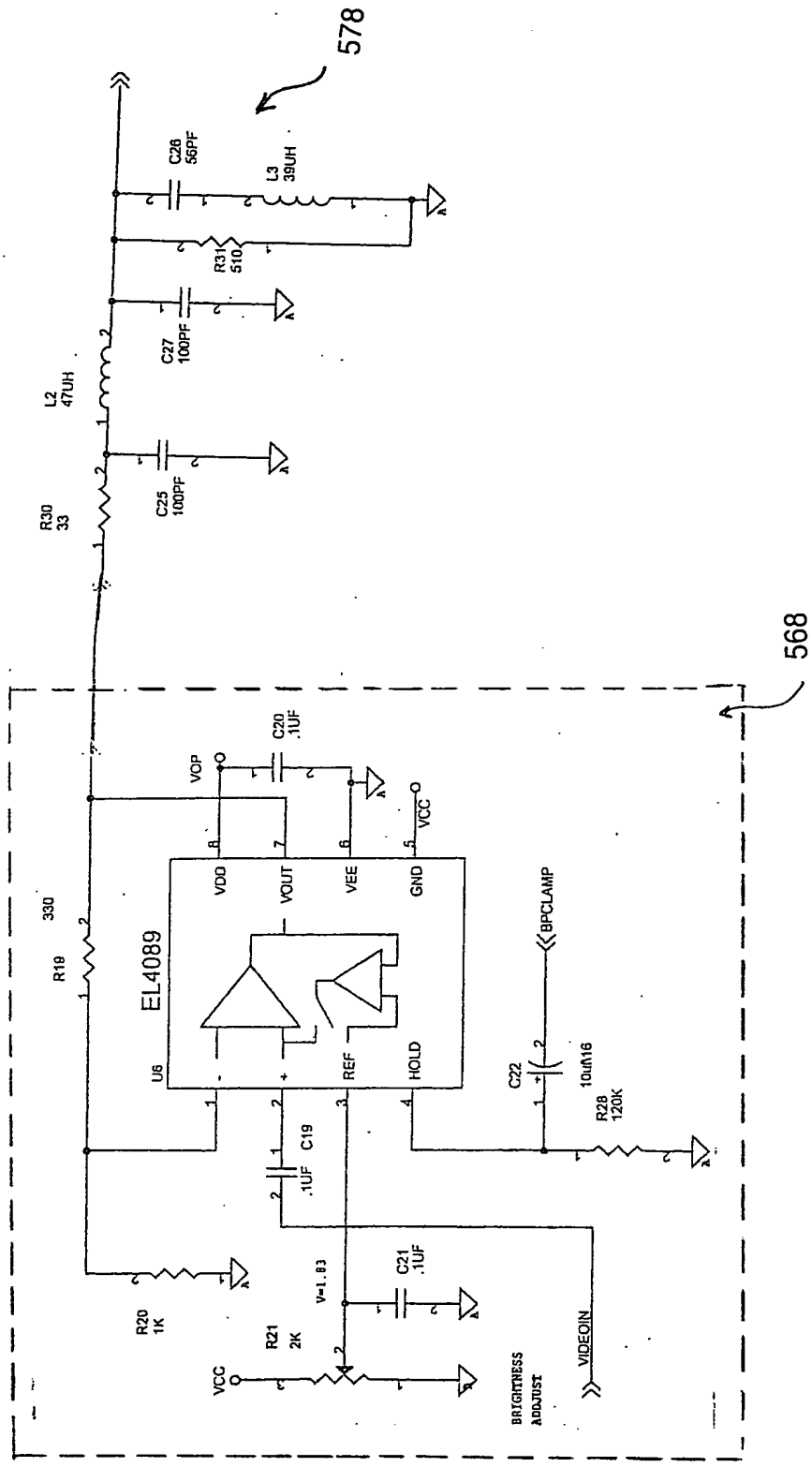

578
568
C26
56PF
L3
39UH
R31
510
C27
100PF
L2
47UH
C25
100PF
R30
33
C20
.1UF
VOP
VCC
VDD
VOUT
VEE
GND
EL4089
U6
REF
HOLD
R19
330
BPCLAMP
C22
10uH16
R28
120K
C19
.1UF
C21
.1UF
V=1.83
R20
1K
R21
2K
VCC
BRIGHTNESS
ADJUST
VIDEOIN

FIG. 28B

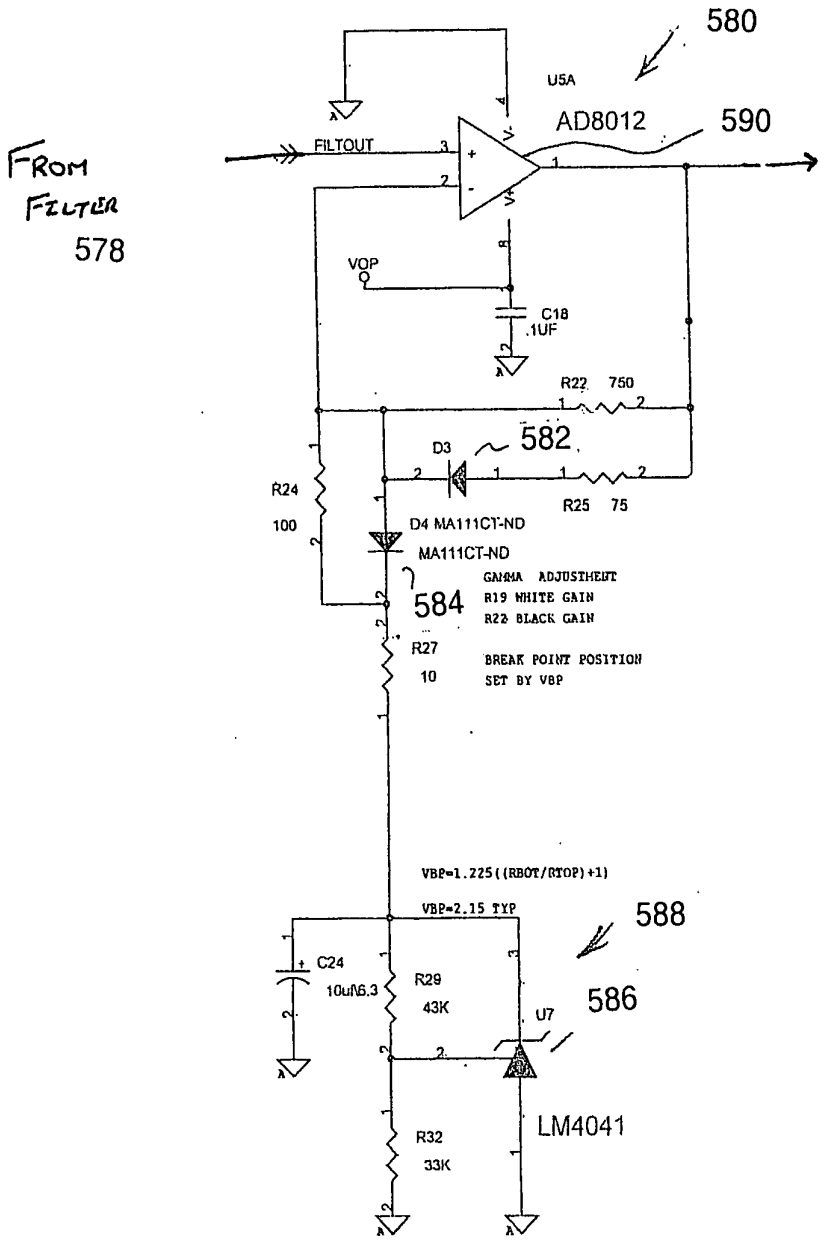

580
U5A
AD8012
590
FROM FILTER 578
FILTOUT
TO DISPLAY
VOP
C18
.1UF
R22 750
582
D3
R25 75
R24
100
D4 MA111CT-ND
MA111CT-ND
GAMMA ADJUSTMENT
R19 WHITE GAIN
R22 BLACK GAIN
584
R27
10
BREAK POINT POSITION
SET BY VBP
VBP=1.225((RBOT/RTOP)+1)
VBP=2.15 TYP
588
C24
10u\6.3
R29
43K
U7
586
LM4041
R32
33K

FIG. 28C

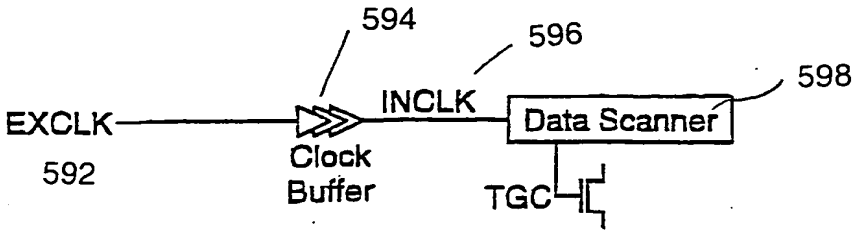


FIG. 29A

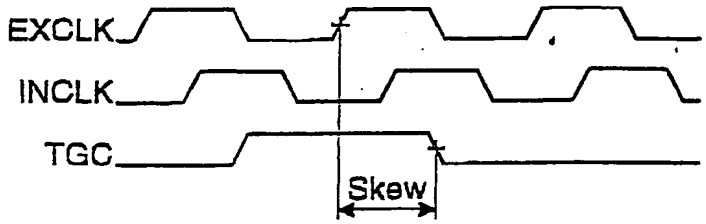


FIG. 29B

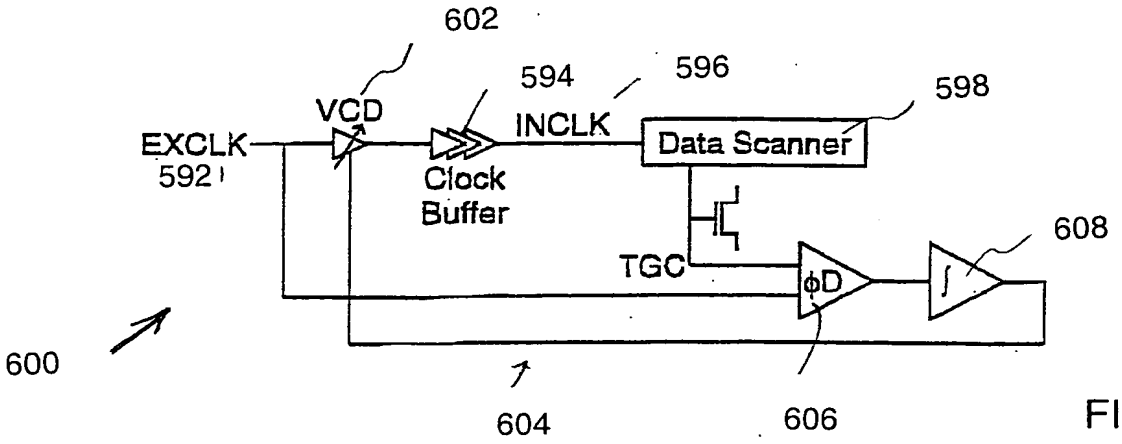


FIG. 29C

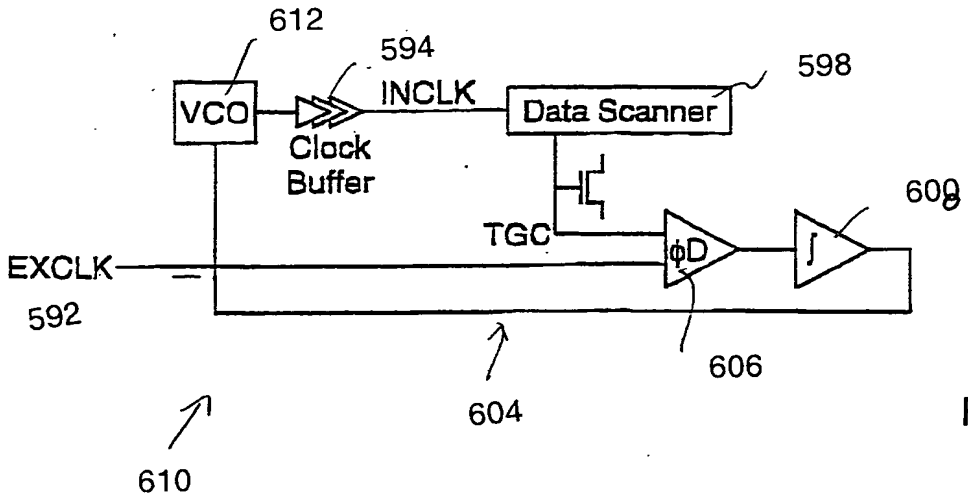


FIG. 29D

SHEET 9909+69

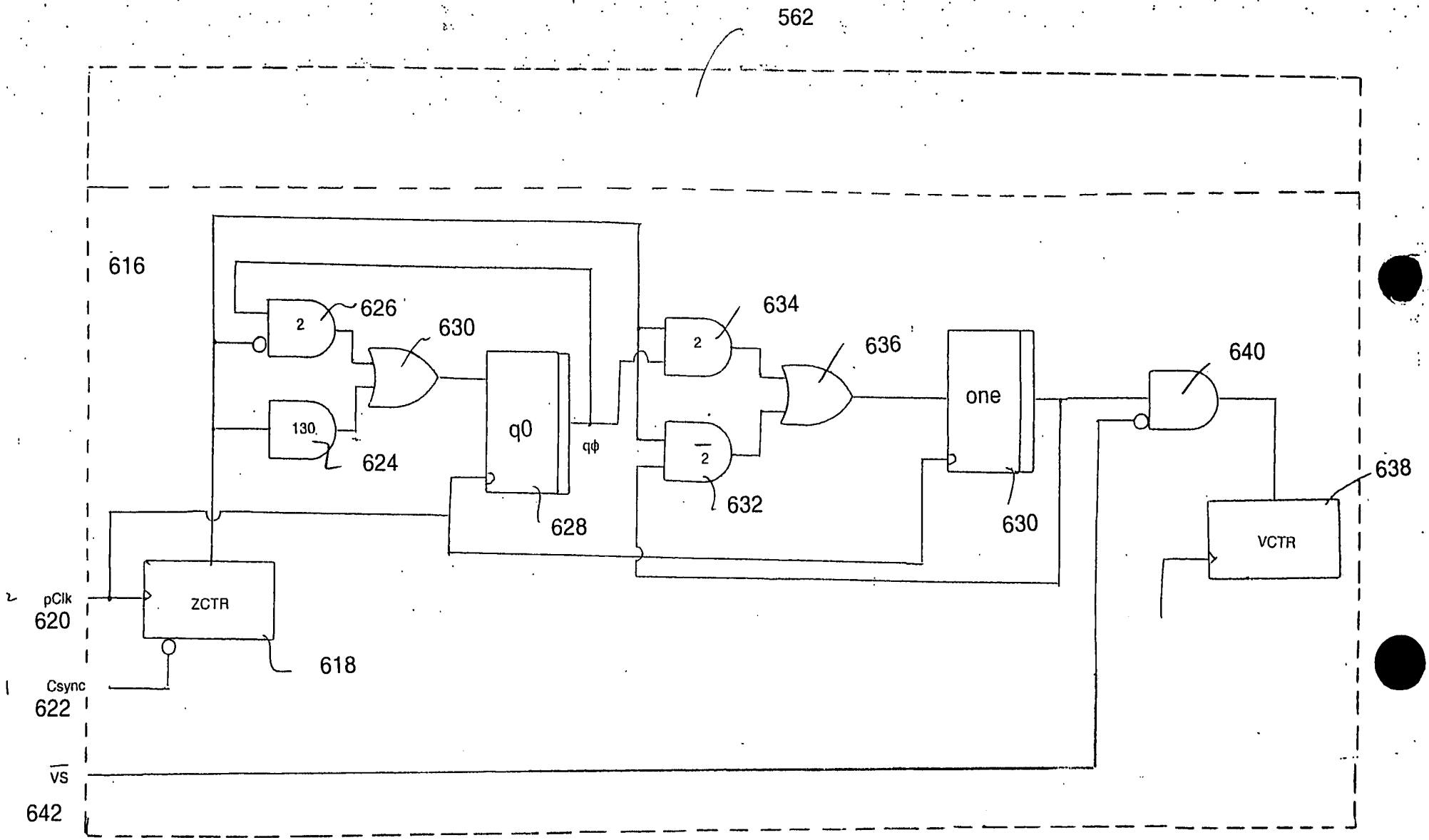


FIG. 30

S64:T2T:9969960

MORE

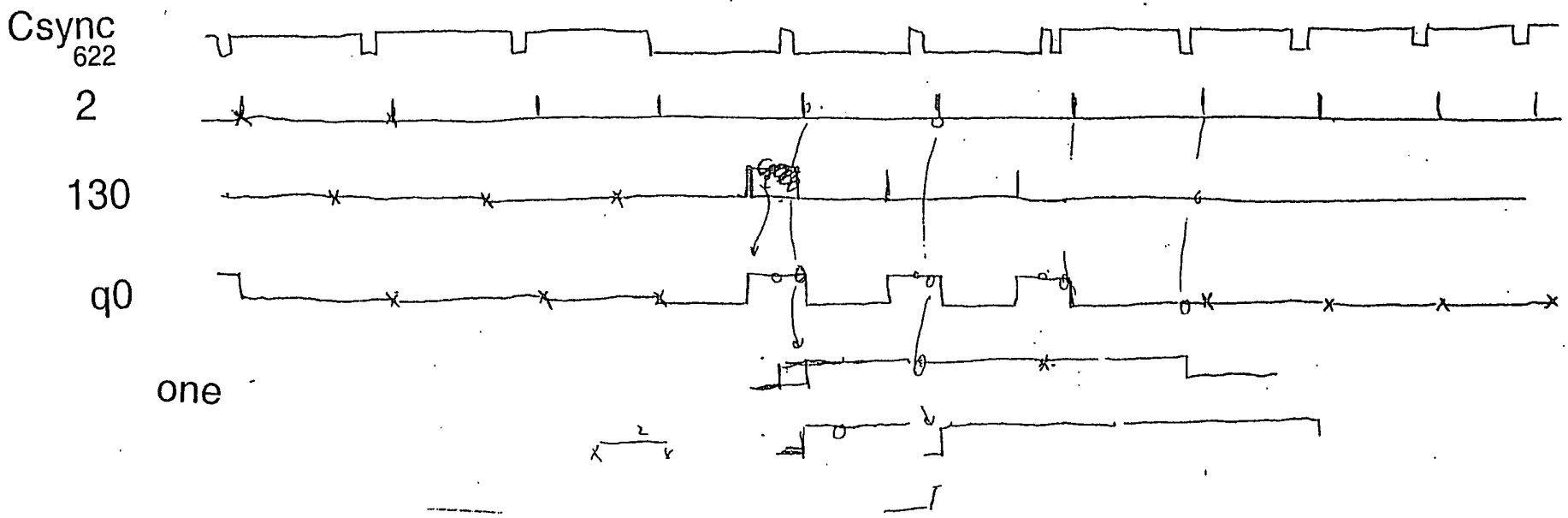


FIG. 31.

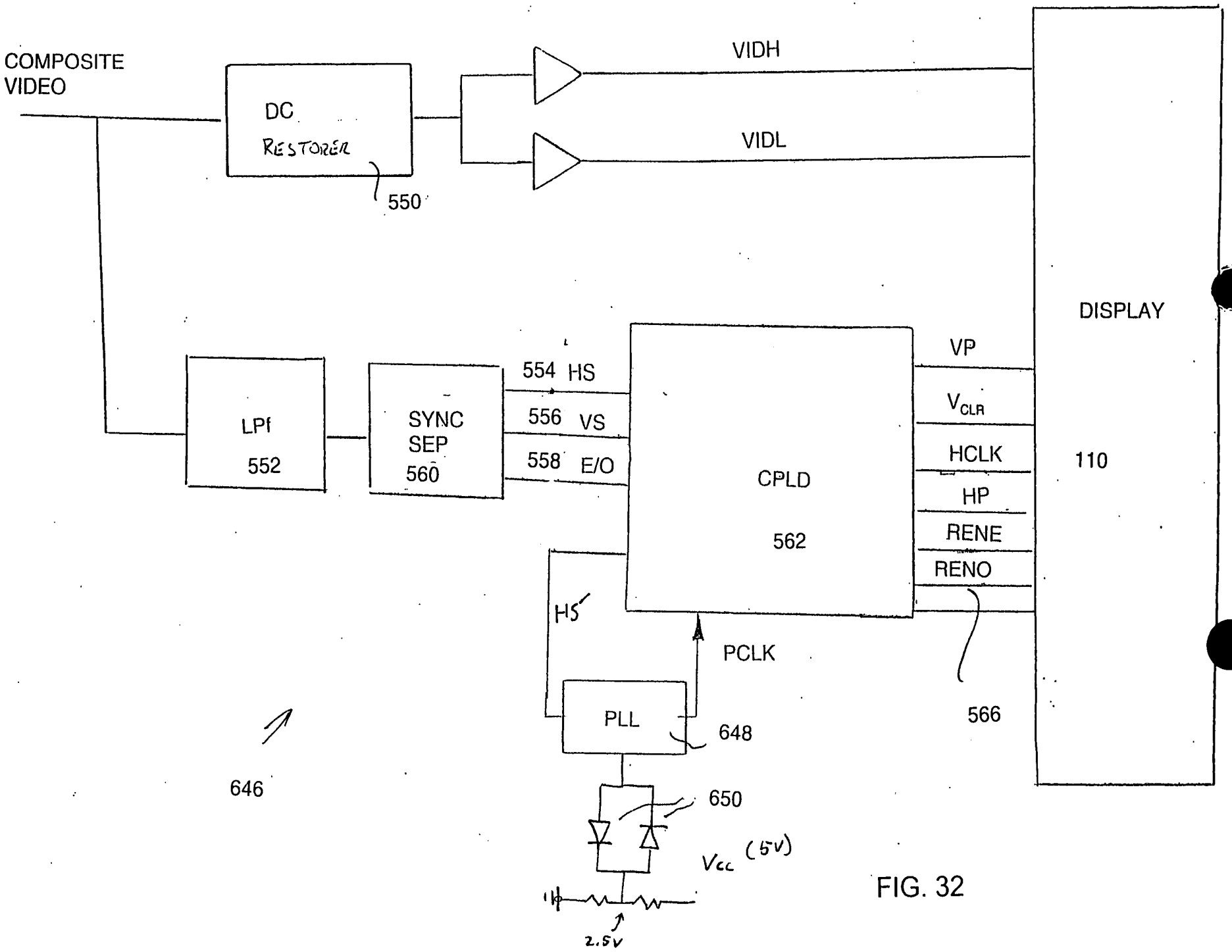

COMPOSITE VIDEO
DC RESTORER
550
VIDH
VIDL
DISPLAY
110
LPf
552
SYNC SEP
560
554 HS
556 VS
558 E/O
CPLD
562
VP
V_{CLR}
HCLK
HP
RENE
RENO
566
HS
PCLK
PLL
648
646
650
V_{cc} (5V)
2.5V

FIG. 32

SHEET 09609460

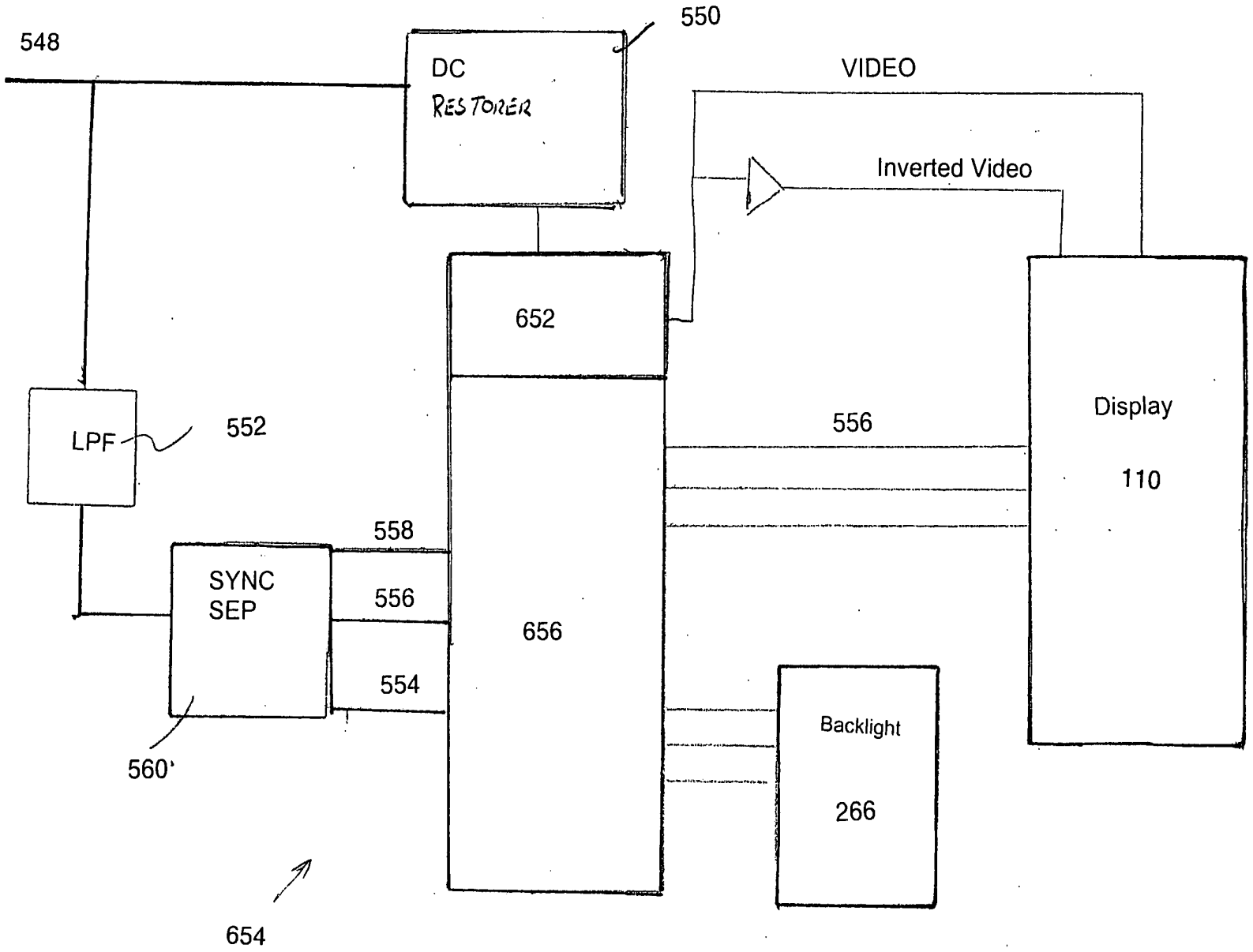
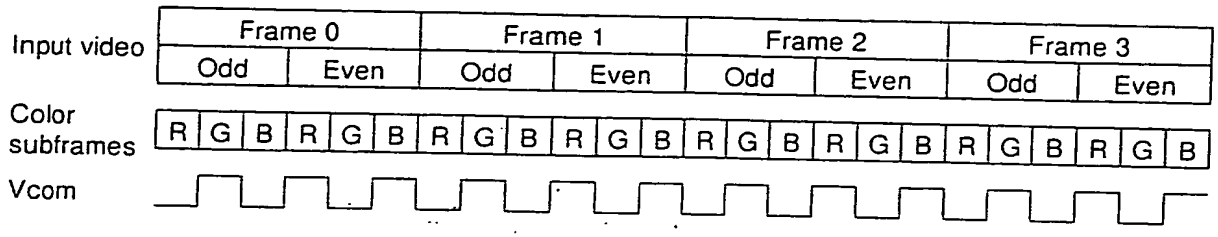


FIG. 33



Timing diagram with 3:1 ratio of subframes to fields

FIG. 34A

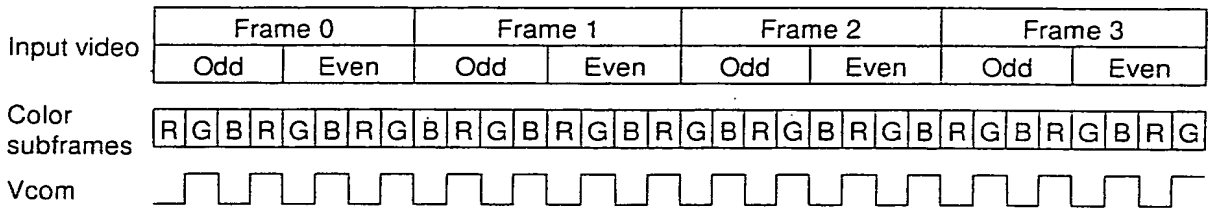


FIG. 34B Timing diagram with 4:1 ratio of subframes to fields

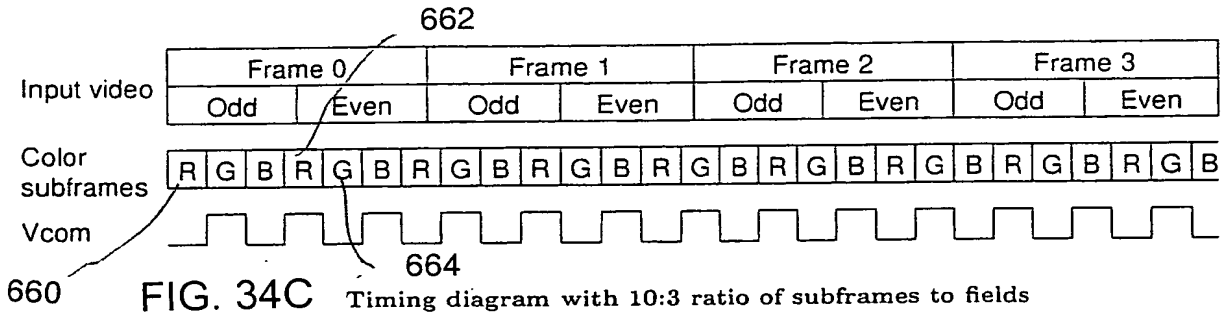


FIG. 34C Timing diagram with 10:3 ratio of subframes to fields

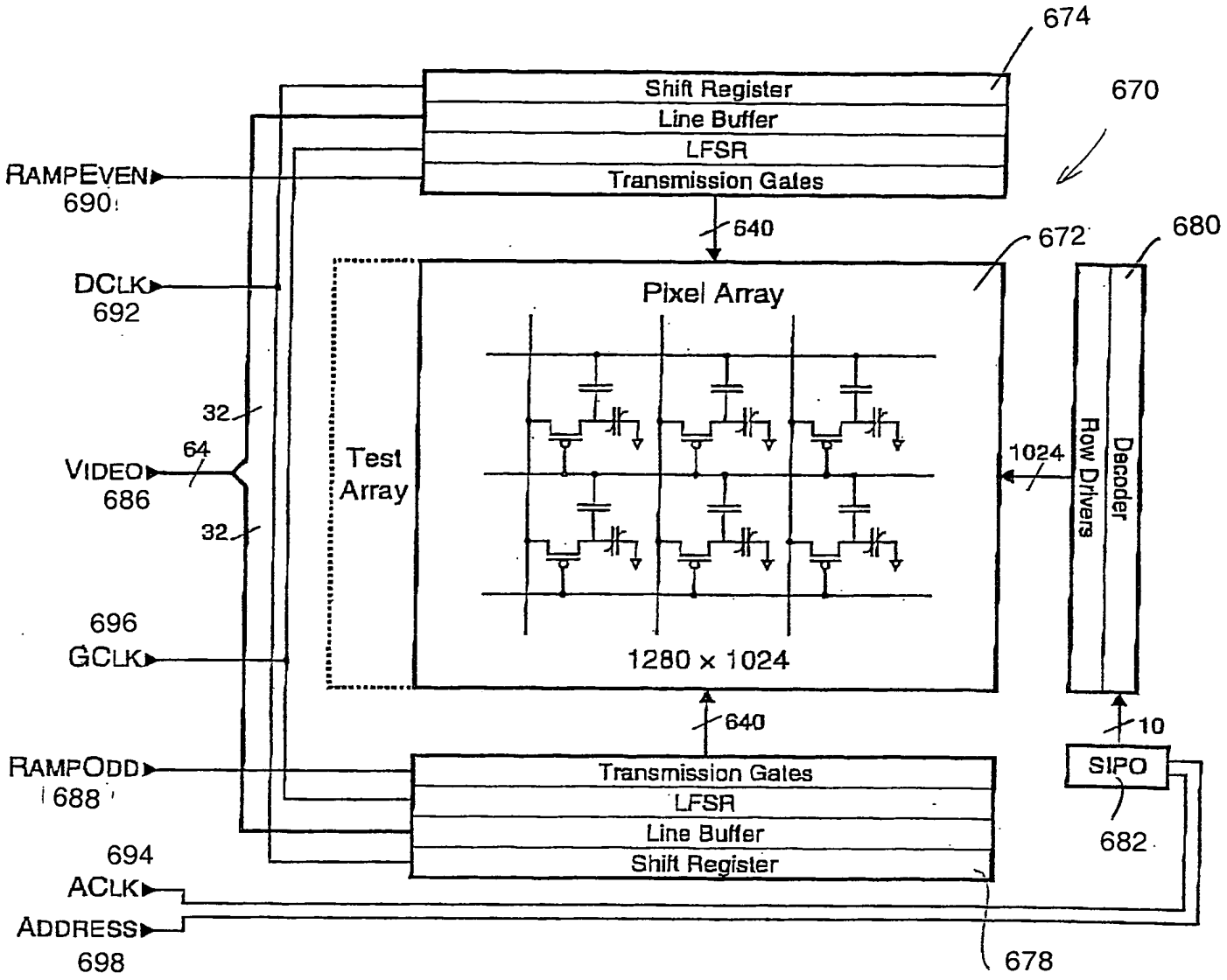

674
Shift Register
Line Buffer
LFSR
Transmission Gates
670
RAMPEVEN
690
640
672
680
DCLK
692
Pixel Array
32
64
VIDEO
686
32
Test
Array
1024
Row Drivers
Decoder
696
GCLK
1280 x 1024
640
10
RAMPODD
688
Transmission Gates
LFSR
Line Buffer
Shift Register
SIPO
682
694
ACLK
ADDRESS
698
678

FIG. 35A

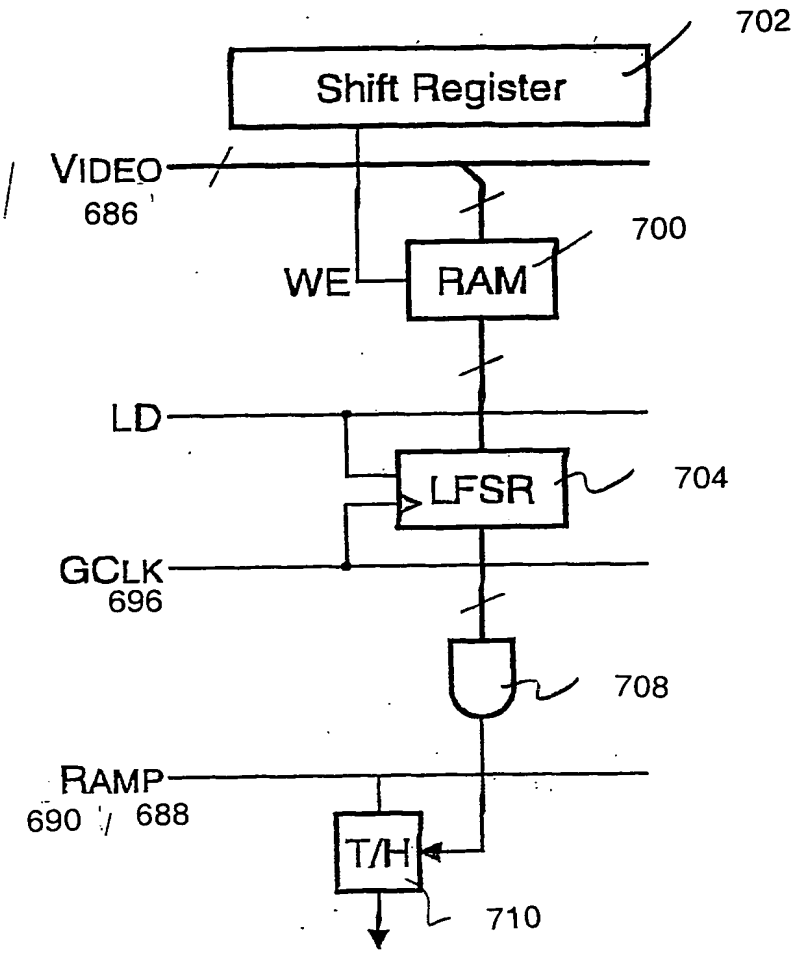

702
Shift Register
VIDEO
686
700
WE
RAM
LD
LFSR
704
GCLK
696
708
RAMP
690
688
T/H
710

FIG. 35B

SEARCH 09609460

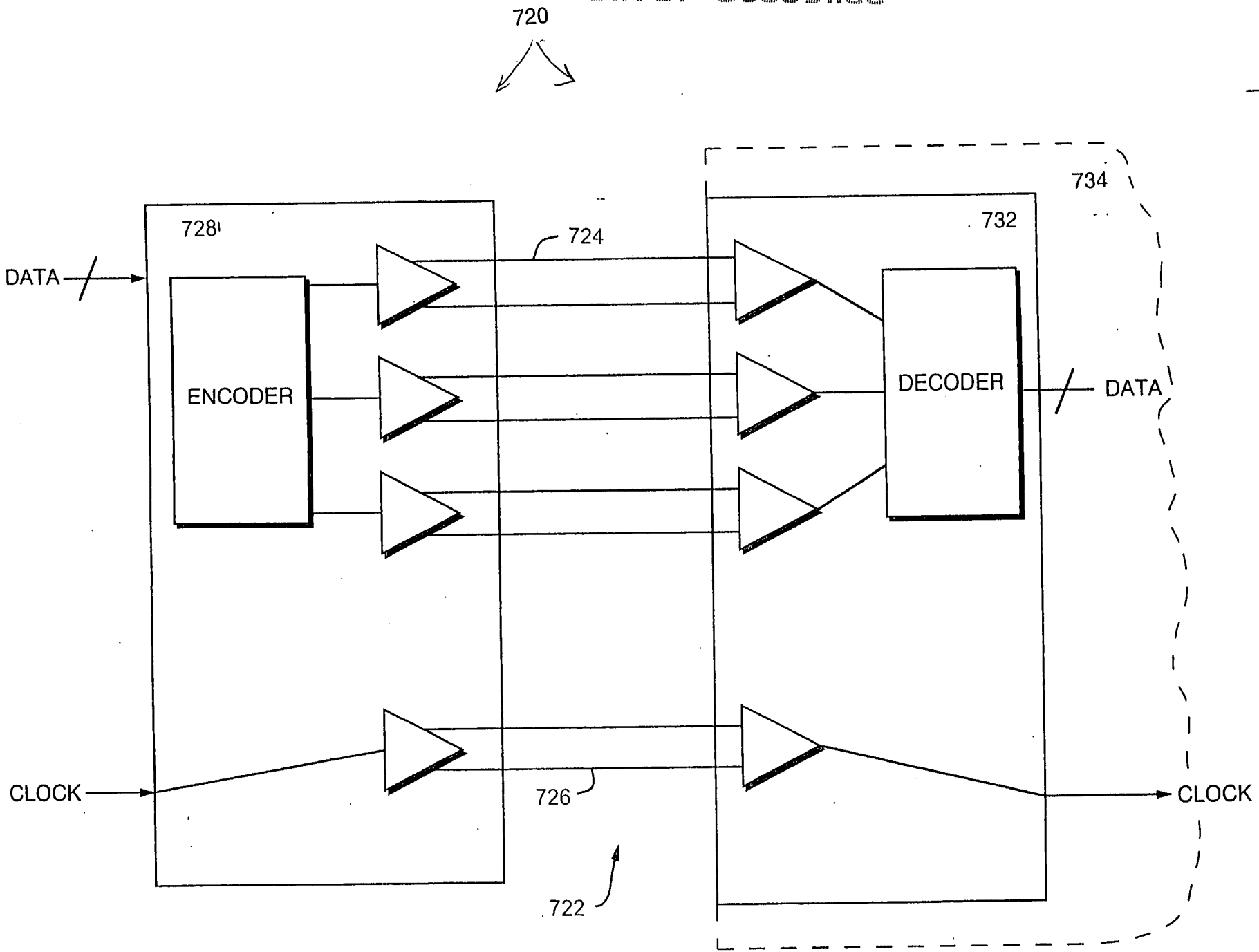


FIG. 36

564T2T 09609460

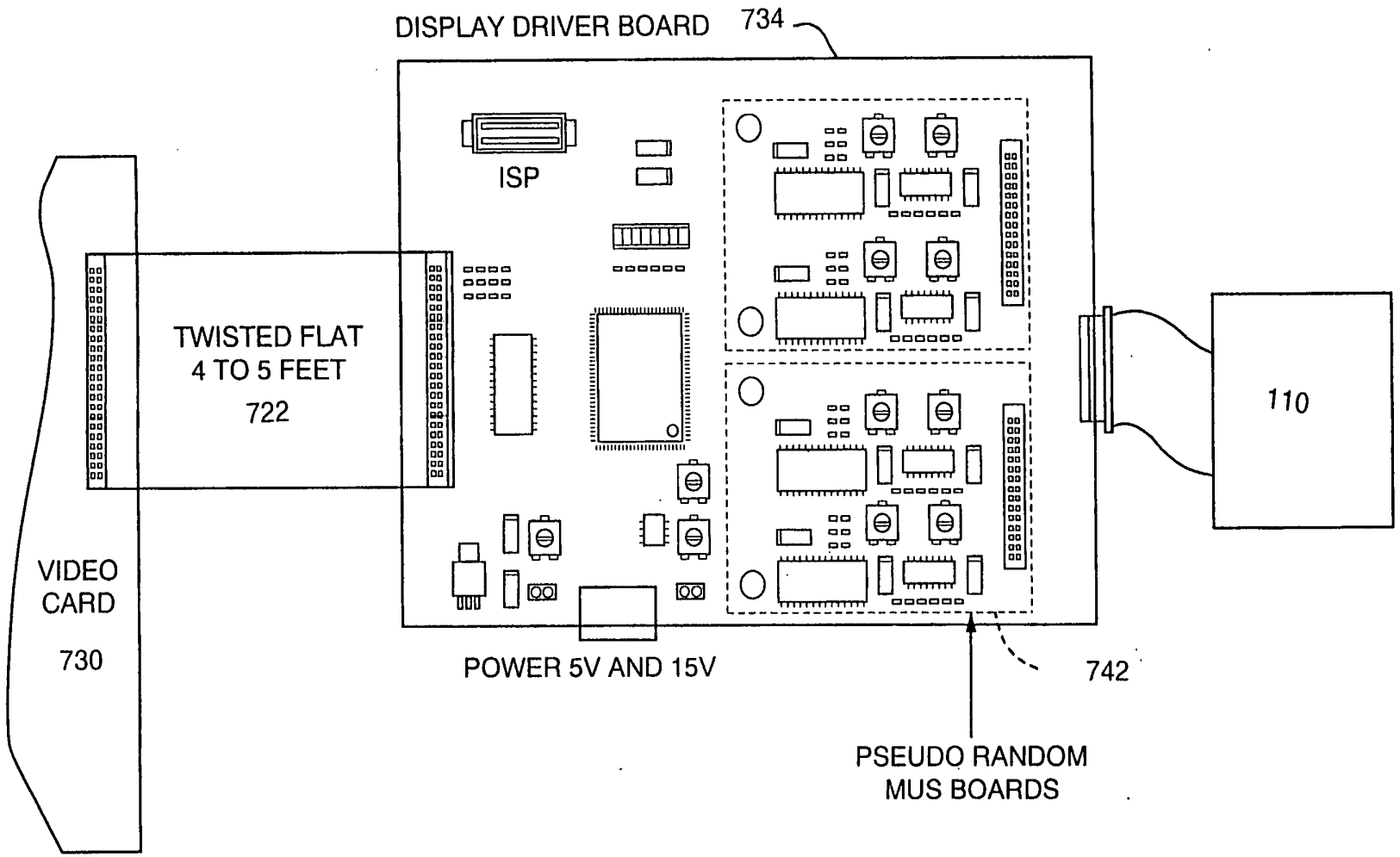


FIG. 37A

564,727 09609460

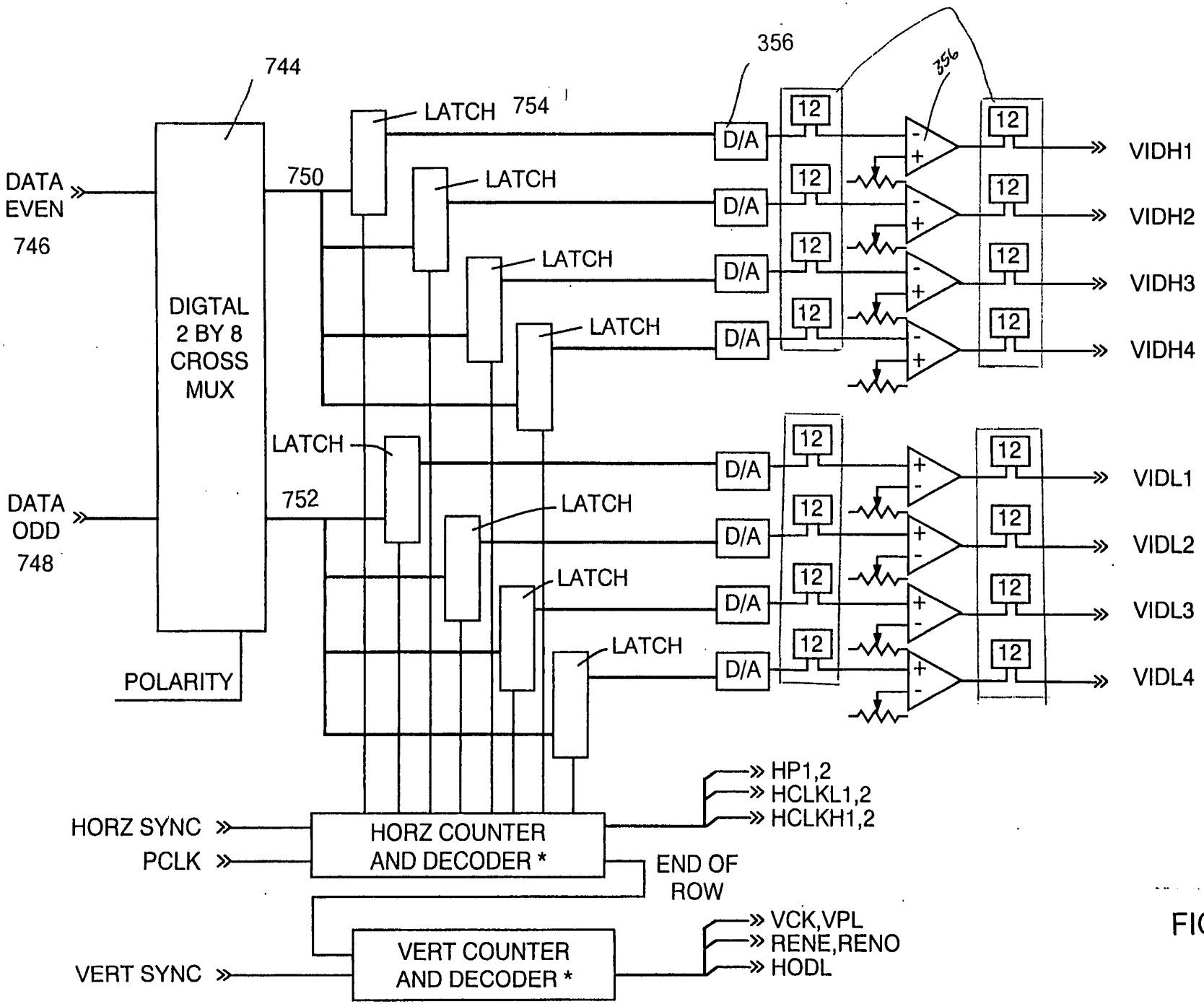


FIG 37B

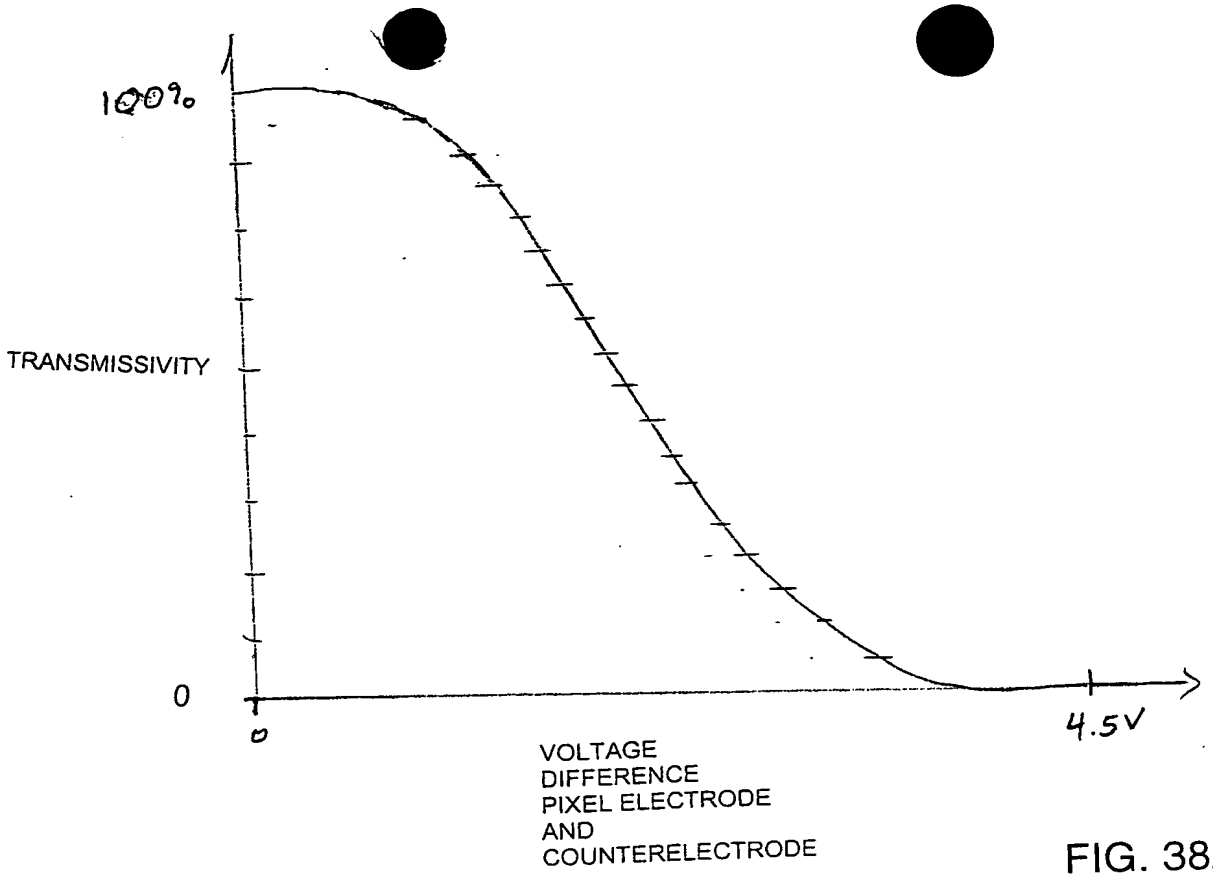


FIG. 38A

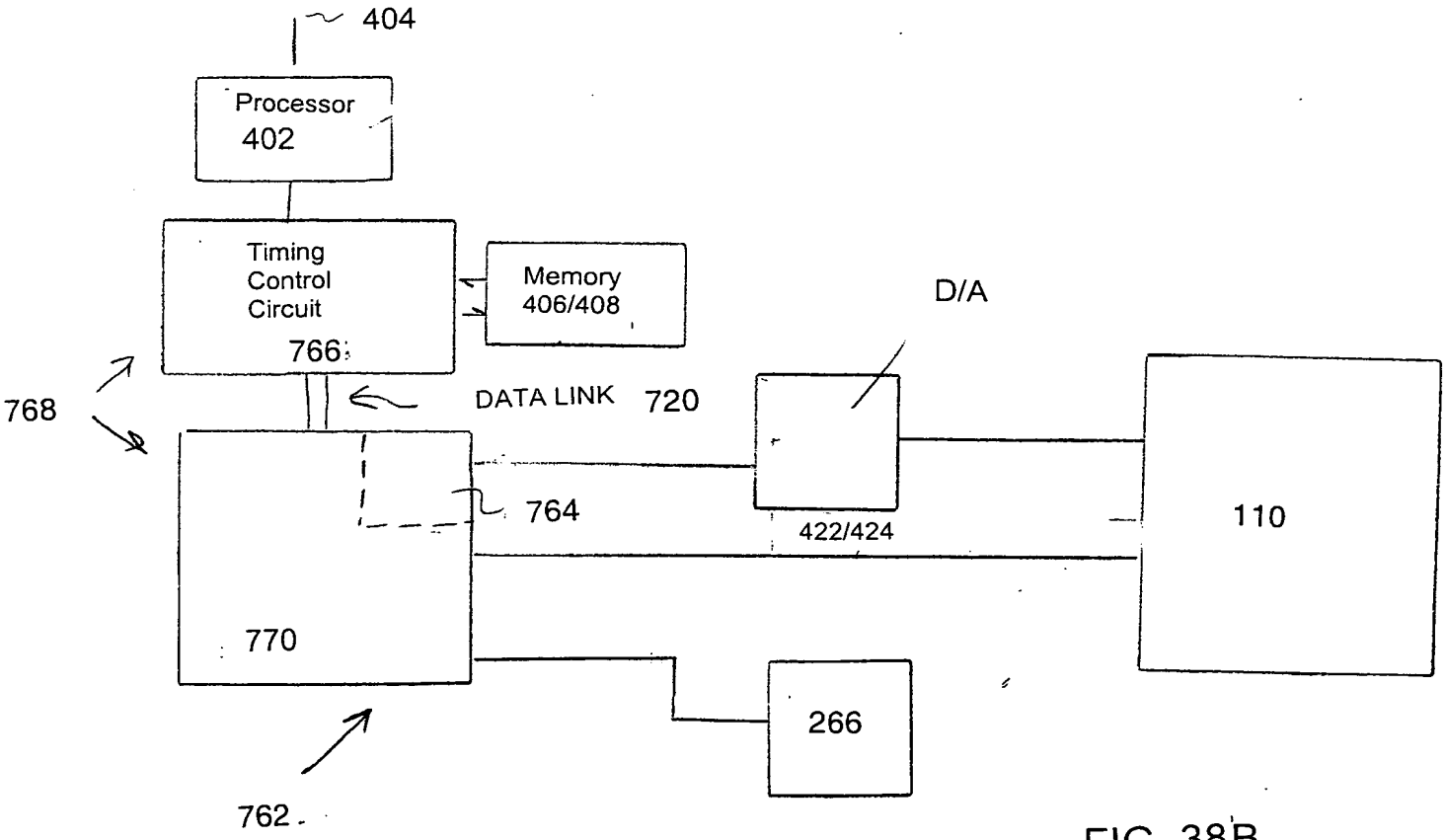
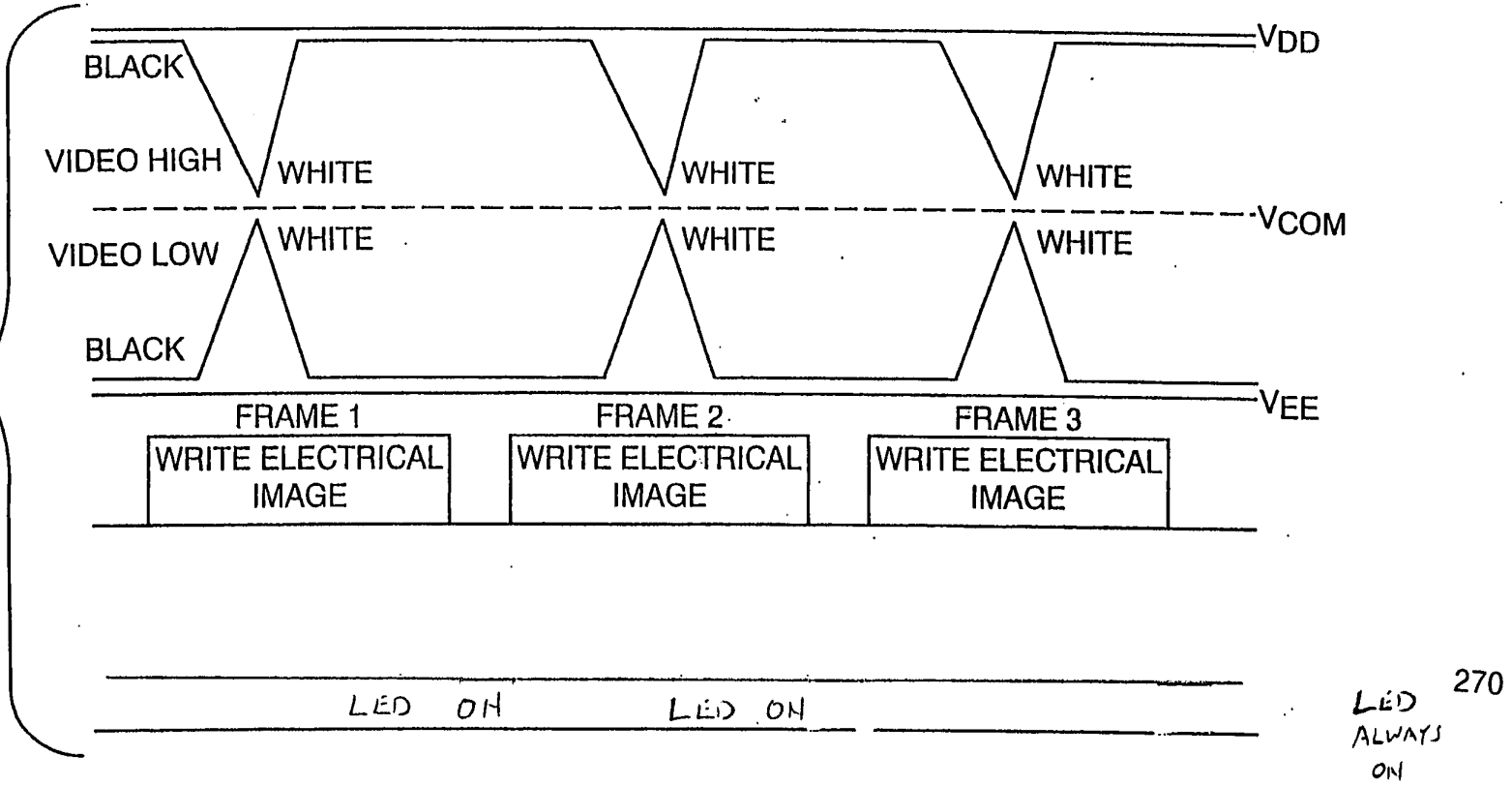


FIG. 38B

664,727 09/09/60

FIG. 39A



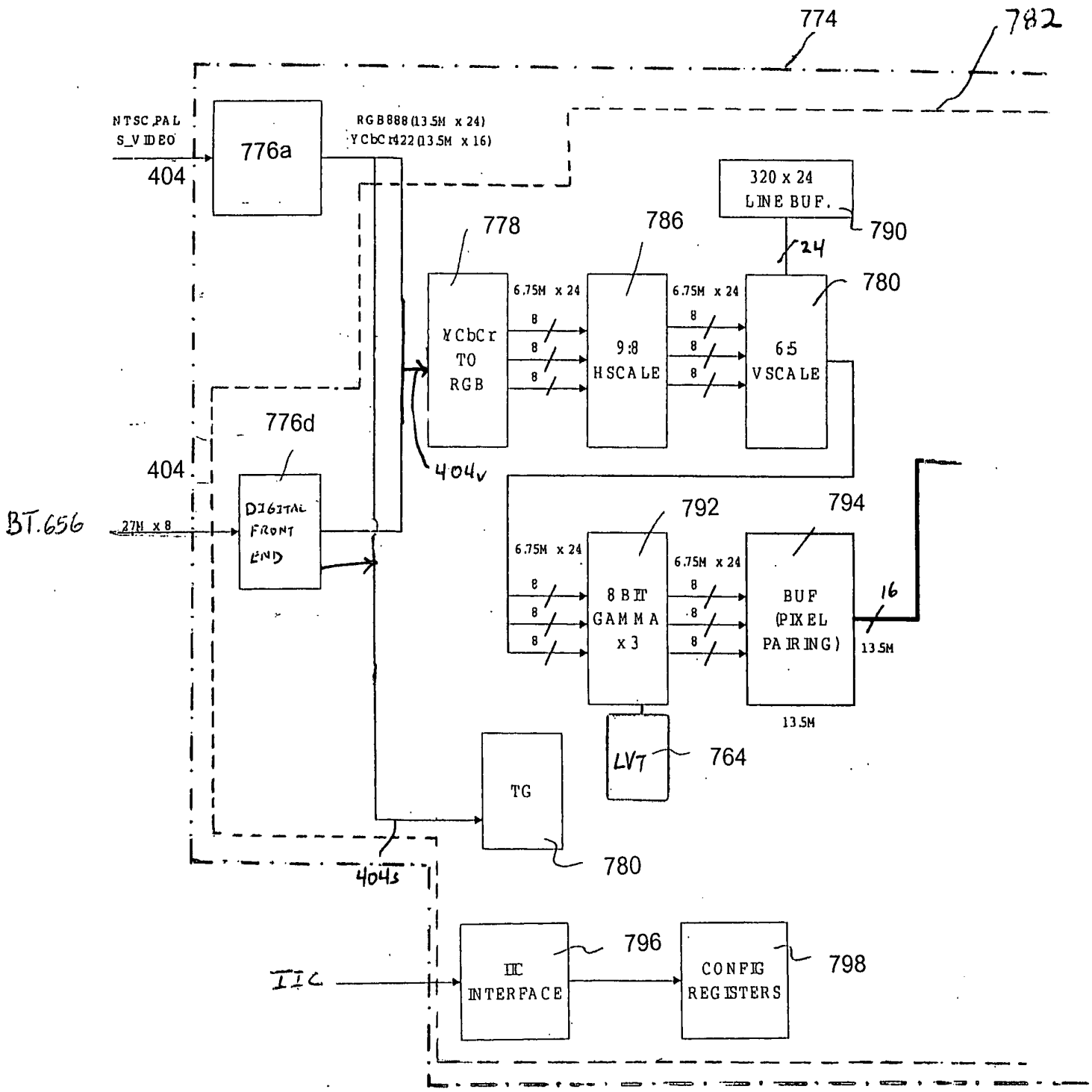

774
782
NTSC,PAL
S_VIDEO
404
776a
RGB888(13.5M x 24)
YCbCr422(13.5M x 16)
320 x 24
LINE BUF.
790
24
778
786
780
6.75M x 24
8
YCbCr
TO
RGB
9:8
HSCALE
6.75M x 24
6.5
VSCALE
776d
404
404V
BT.656
27M x 8
DIGITAL
FRONT
END
792
794
6.75M x 24
8 BIT
GAMMA
x3
BUF
(PIXEL
PAIRING)
16
13.5M
13.5M
LV7
764
TG
780
404S
I2C
I2C
INTERFACE
796
CONFIG
REGISTERS
798

FIG. 39B1

SEARCH 09509460

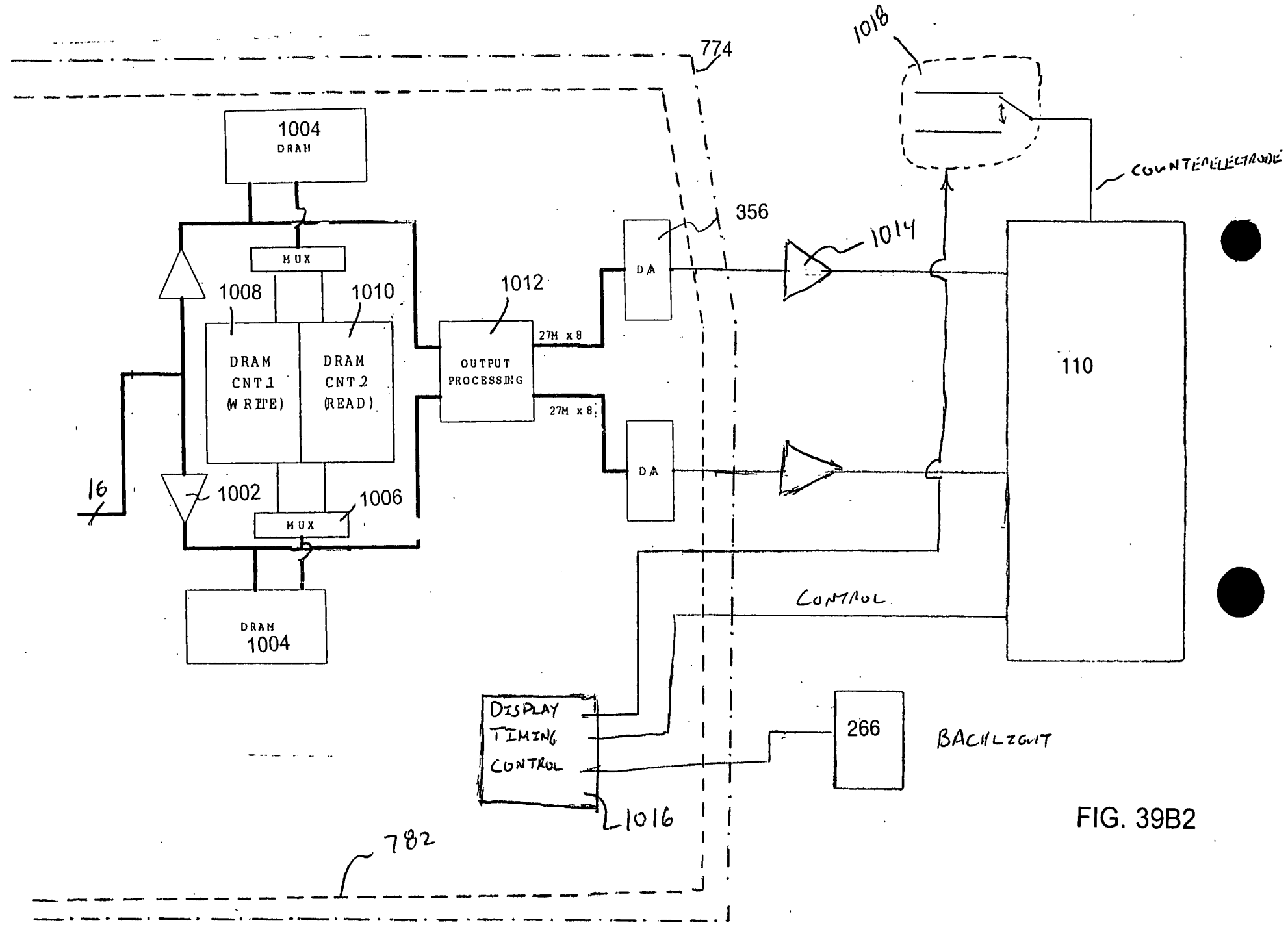


FIG. 39B2

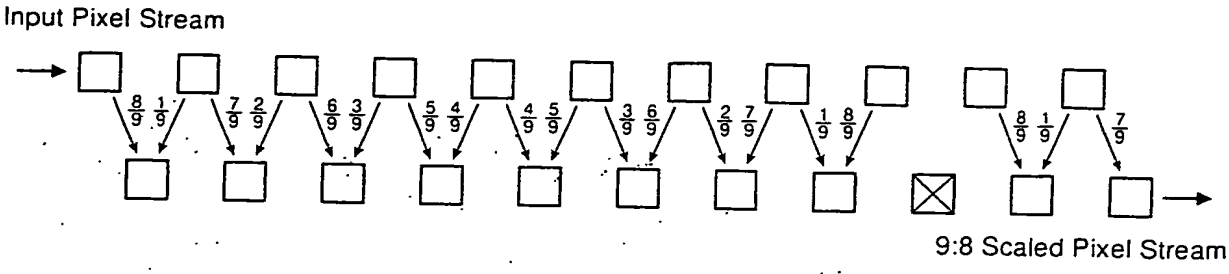


FIG. 39C 9:8 Horizontal Scaling by Interpolation

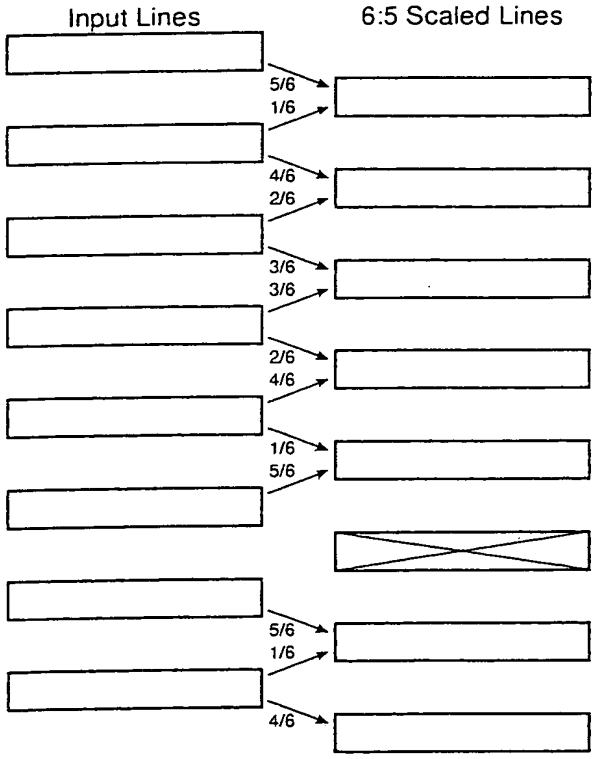


FIG. 39D 6:5 Vertical Scaling by Interpolation

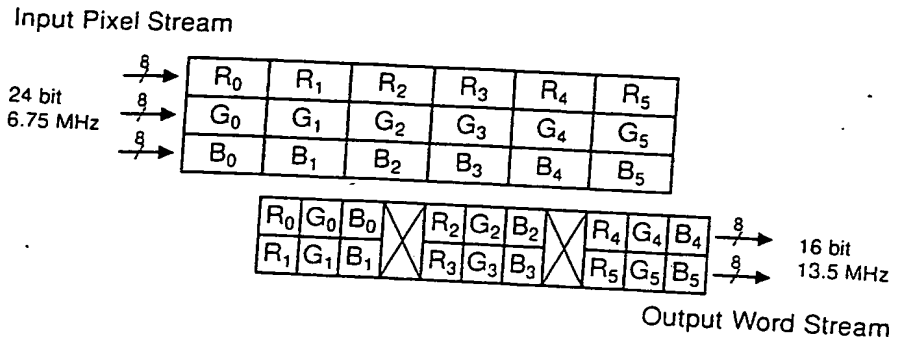


FIG. 39E Pixel Pairing

6,717,376

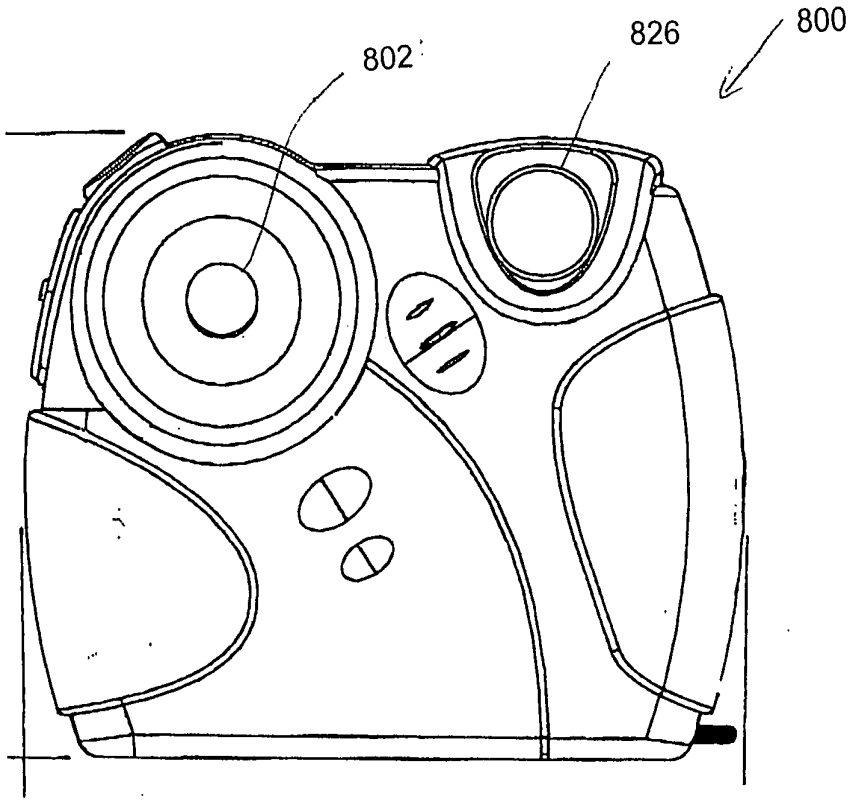


FIG. 40A

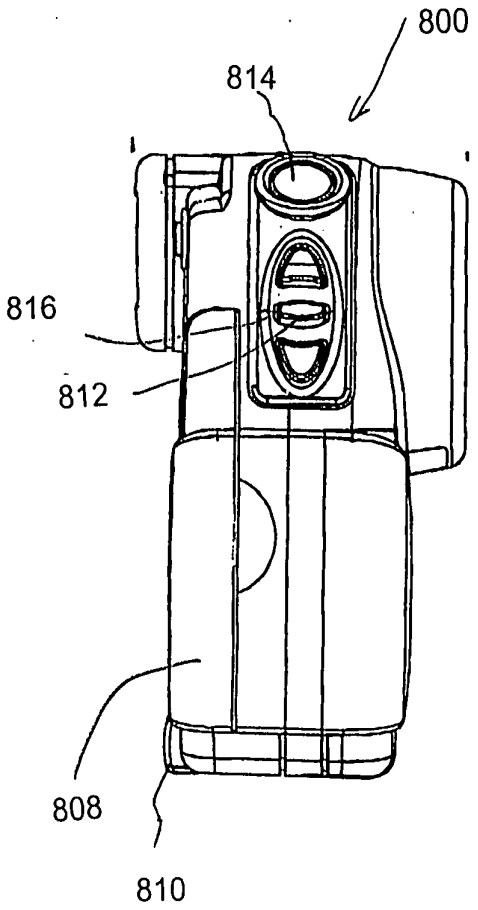


FIG. 40C

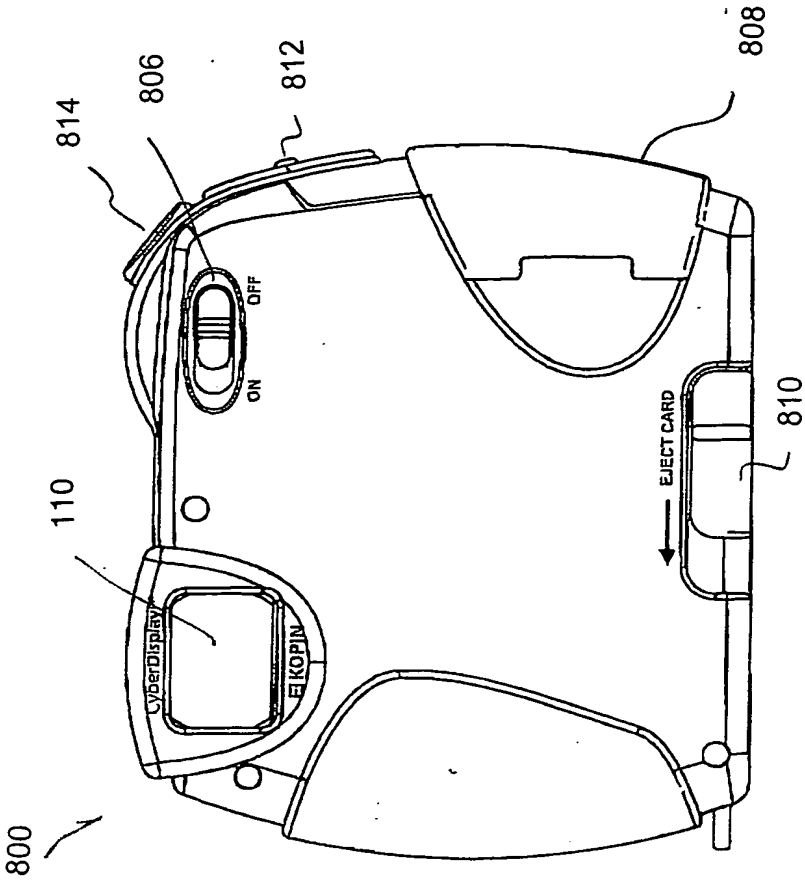


FIG. 40B

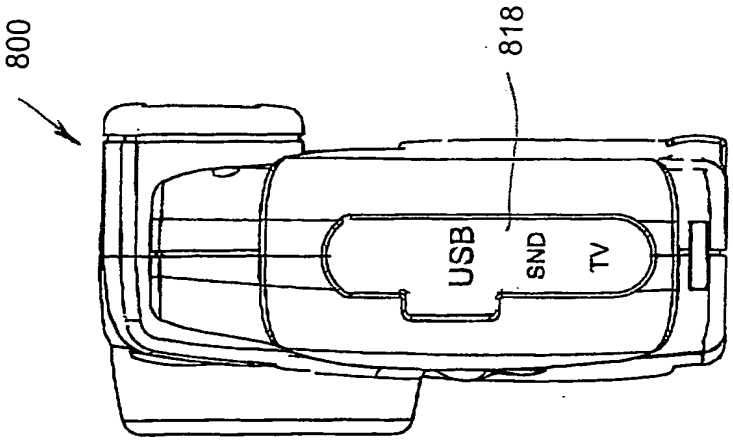


FIG. 40D

6611121 09609160

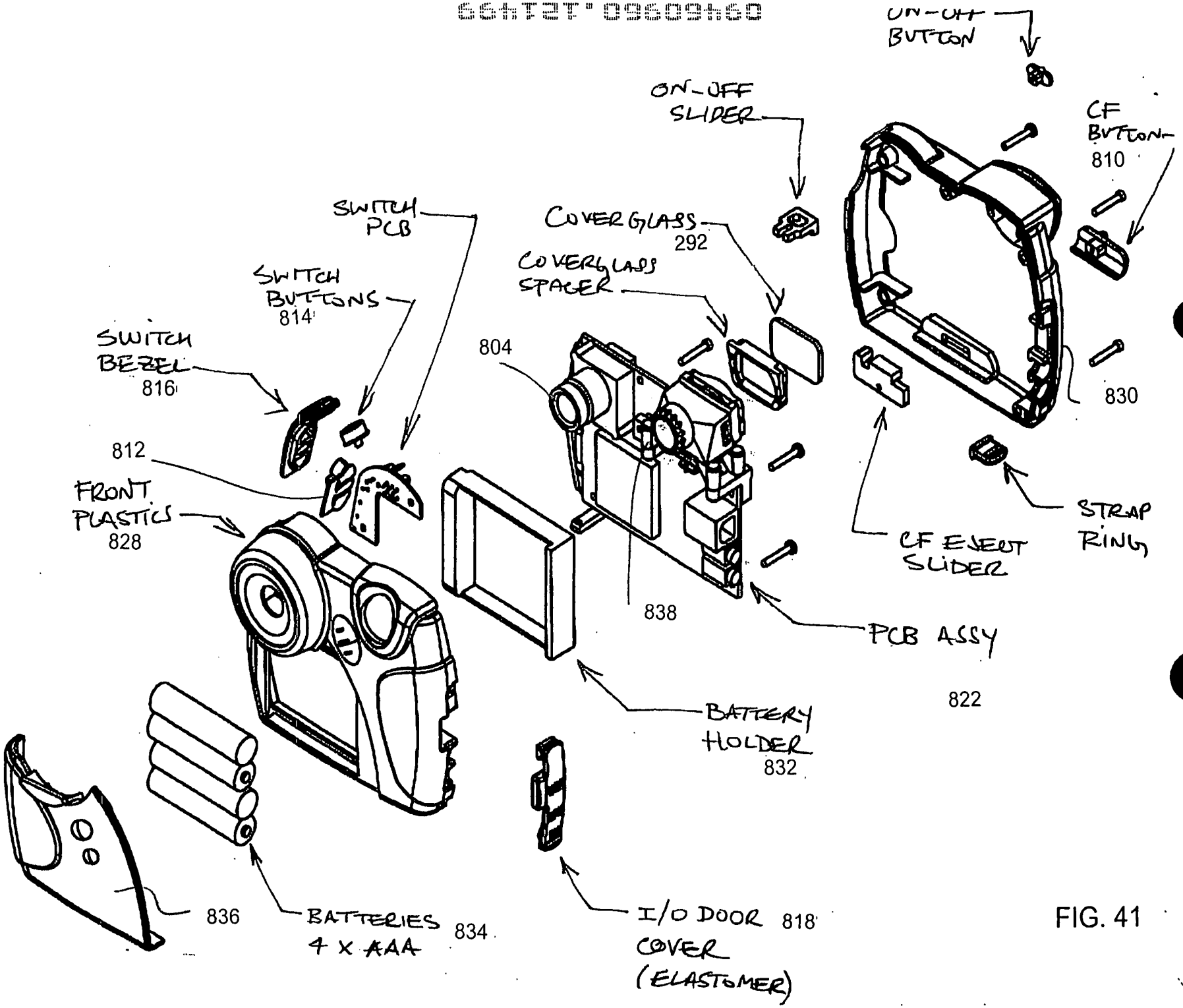


FIG. 41

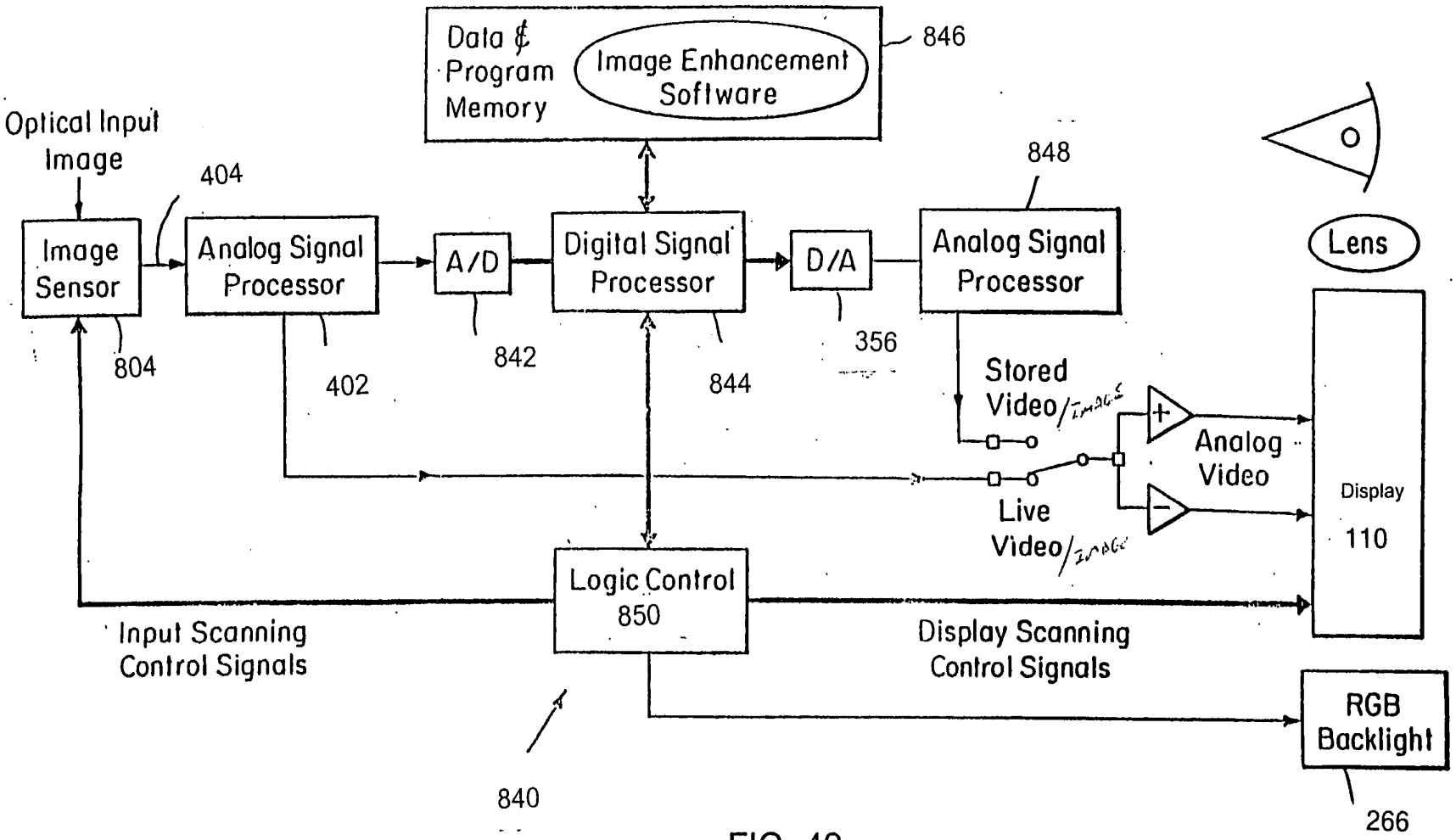

Data & Program Memory
Image Enhancement Software
846
Optical Input Image
404
Image Sensor
804
Analog Signal Processor
402
A/D
842
Digital Signal Processor
844
D/A
356
848
Analog Signal Processor
Lens
Stored Video/Image
Live Video/Image
Analog Video
Display
110
Logic Control
850
Input Scanning Control Signals
Display Scanning Control Signals
RGB Backlight
266
840

FIG. 42

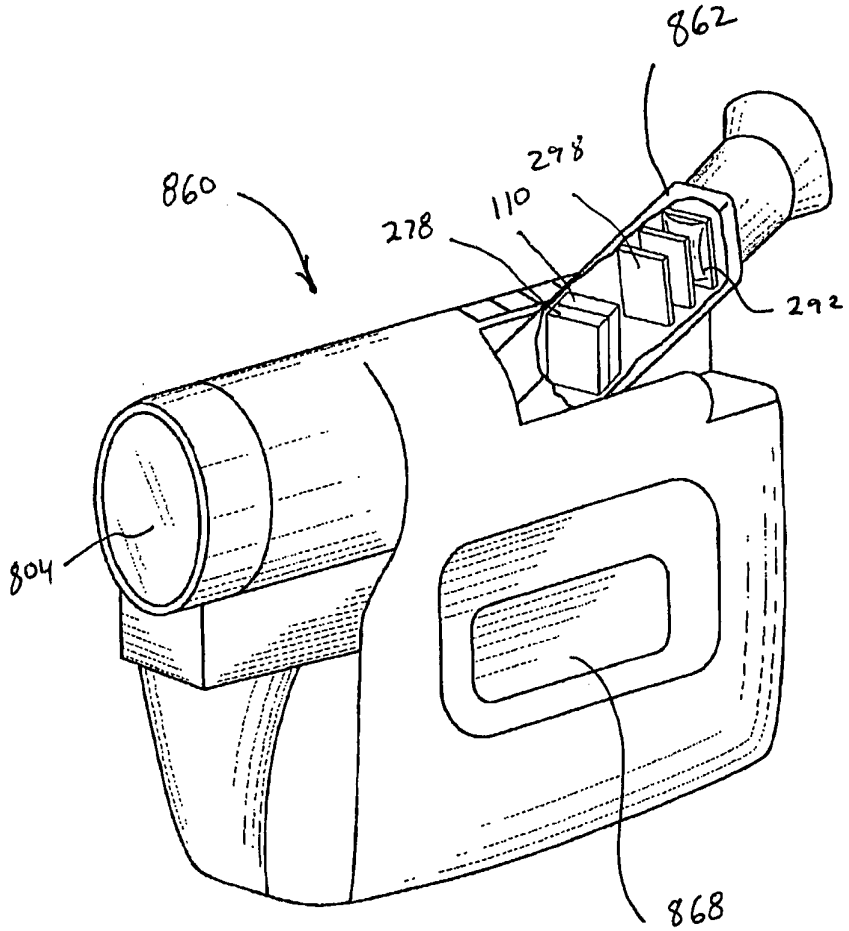
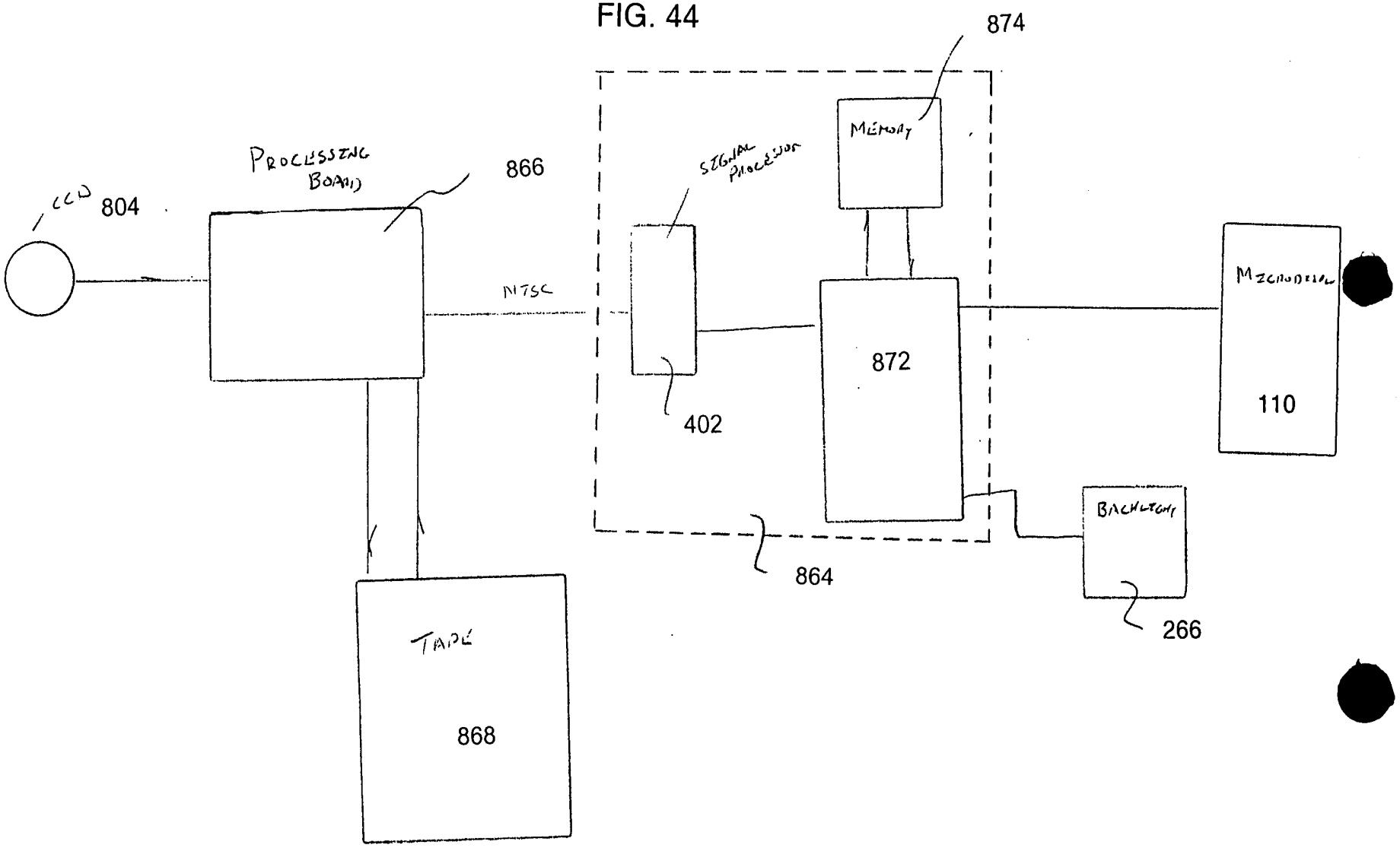


FIG. 43

FIG. 44


874
MEMORY
SIGNAL PROCESSOR
PROCESSING BOARD
866
CCD
804
NTSC
872
402
110
BACKLIGHT
266
TAPE
868
864

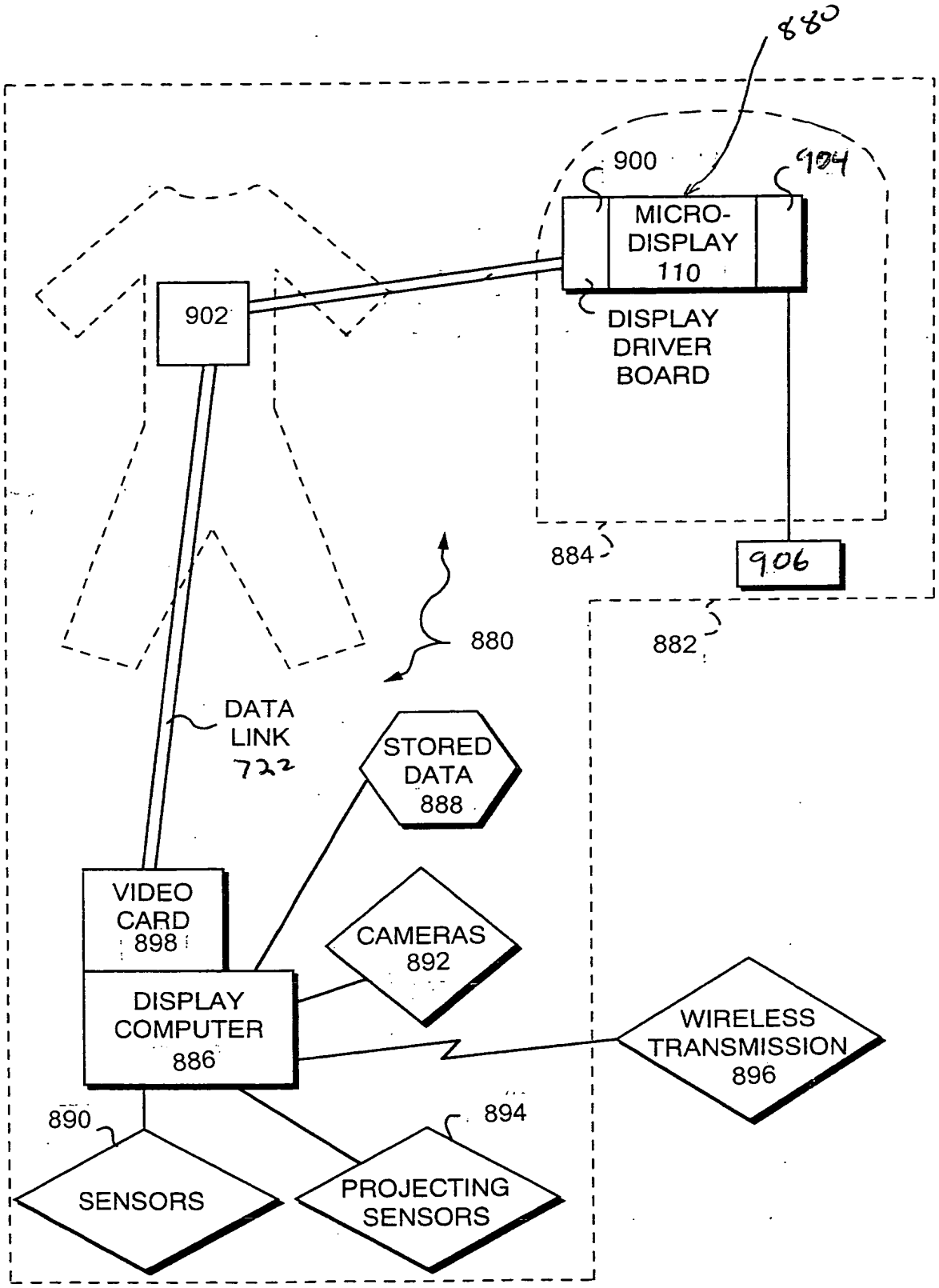

880
900
904
MICRO-
DISPLAY
110
902
DISPLAY
DRIVER
BOARD
884
906
882
880
DATA
LINK
722
STORED
DATA
888
VIDEO
CARD
898
CAMERAS
892
DISPLAY
COMPUTER
886
WIRELESS
TRANSMISSION
896
890
894
SENSORS
PROJECTING
SENSORS

FIG. 45

6,611,262

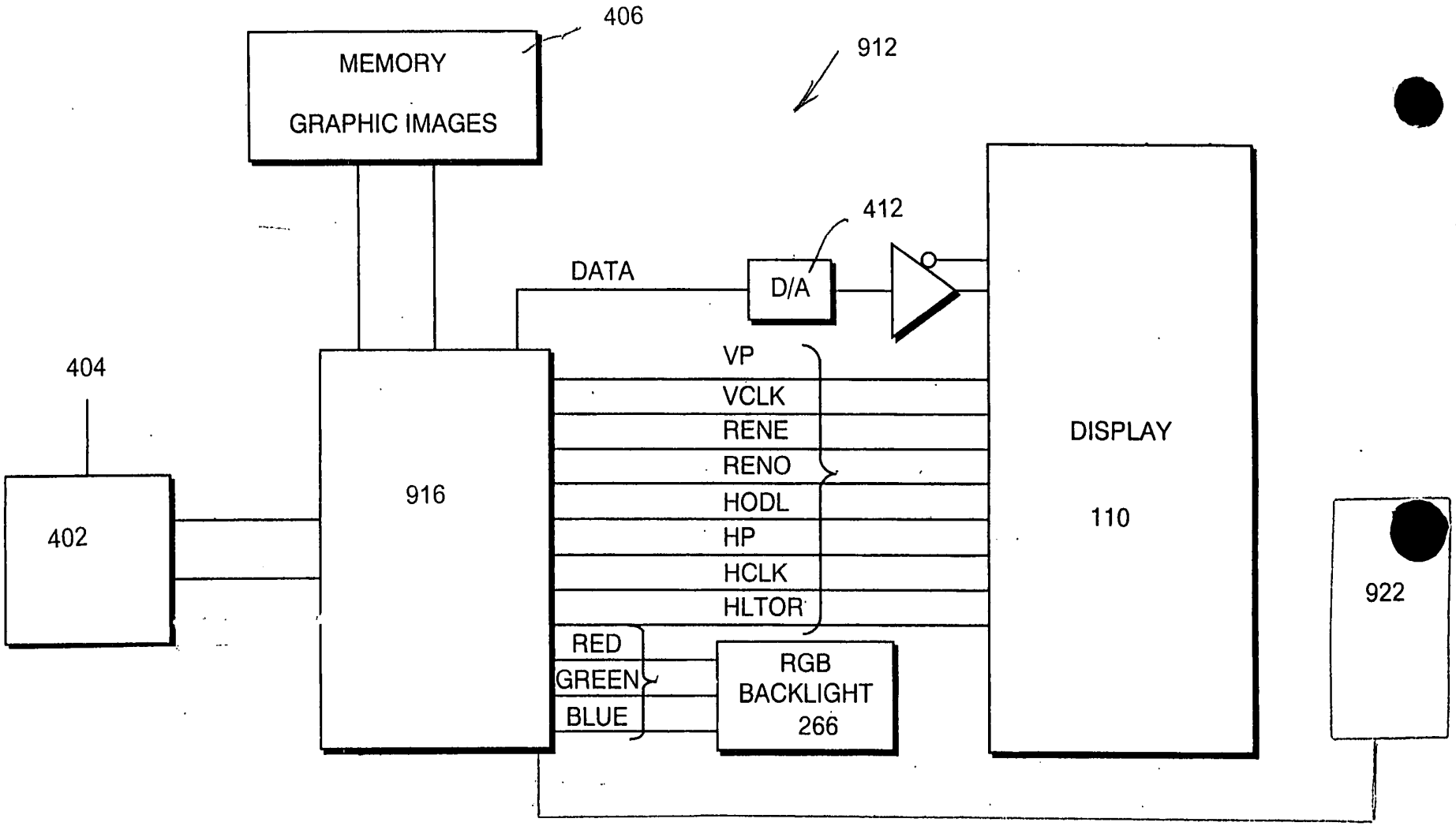


FIG. 46

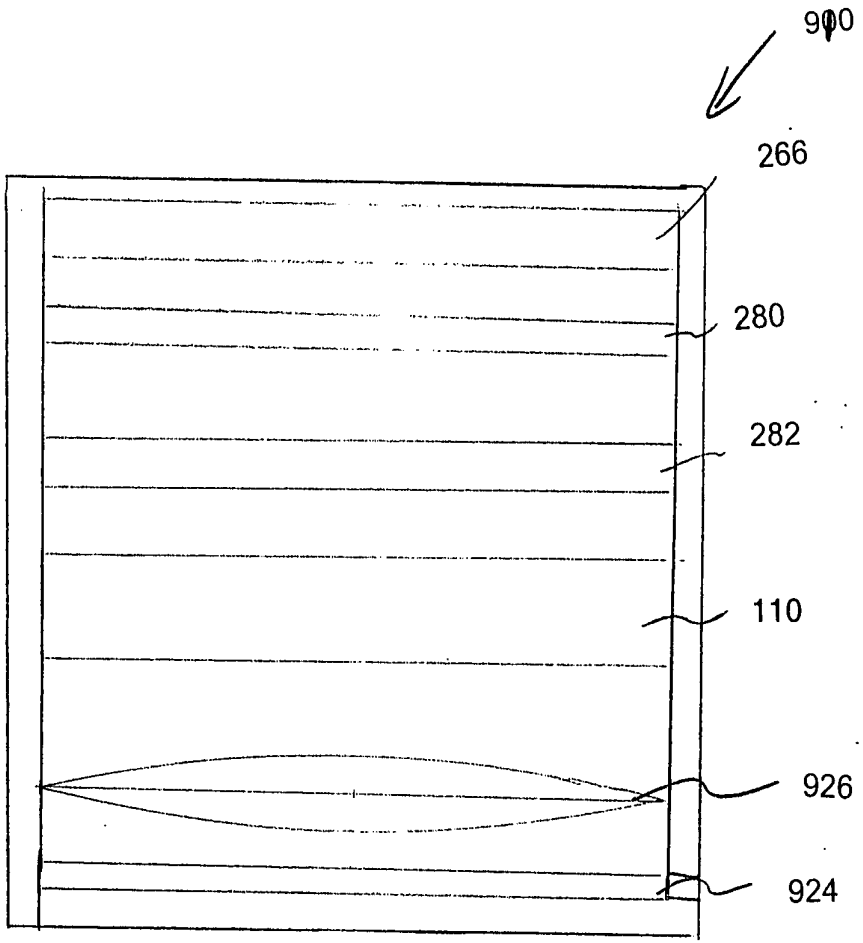


FIG. 47

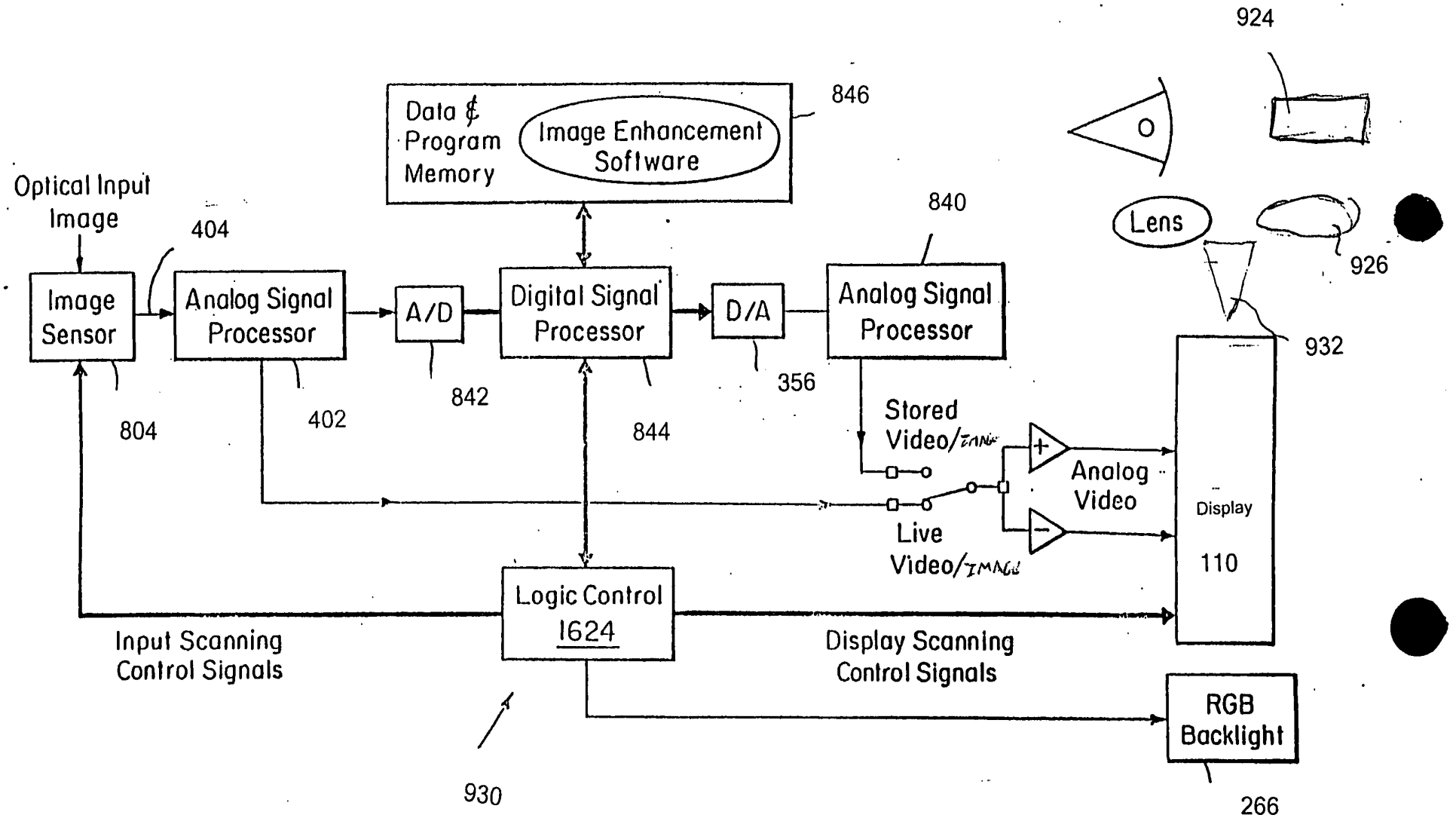

924
Data & Program Memory
Image Enhancement Software
846
Optical Input Image
404
840
Lens
926
Image Sensor
Analog Signal Processor
A/D
Digital Signal Processor
D/A
Analog Signal Processor
932
804
402
842
844
356
Stored Video/IMAGE
Analog Video
Live Video/IMAGE
Display
110
Logic Control
1624
Input Scanning Control Signals
Display Scanning Control Signals
RGB Backlight
930
266

FIG. 48

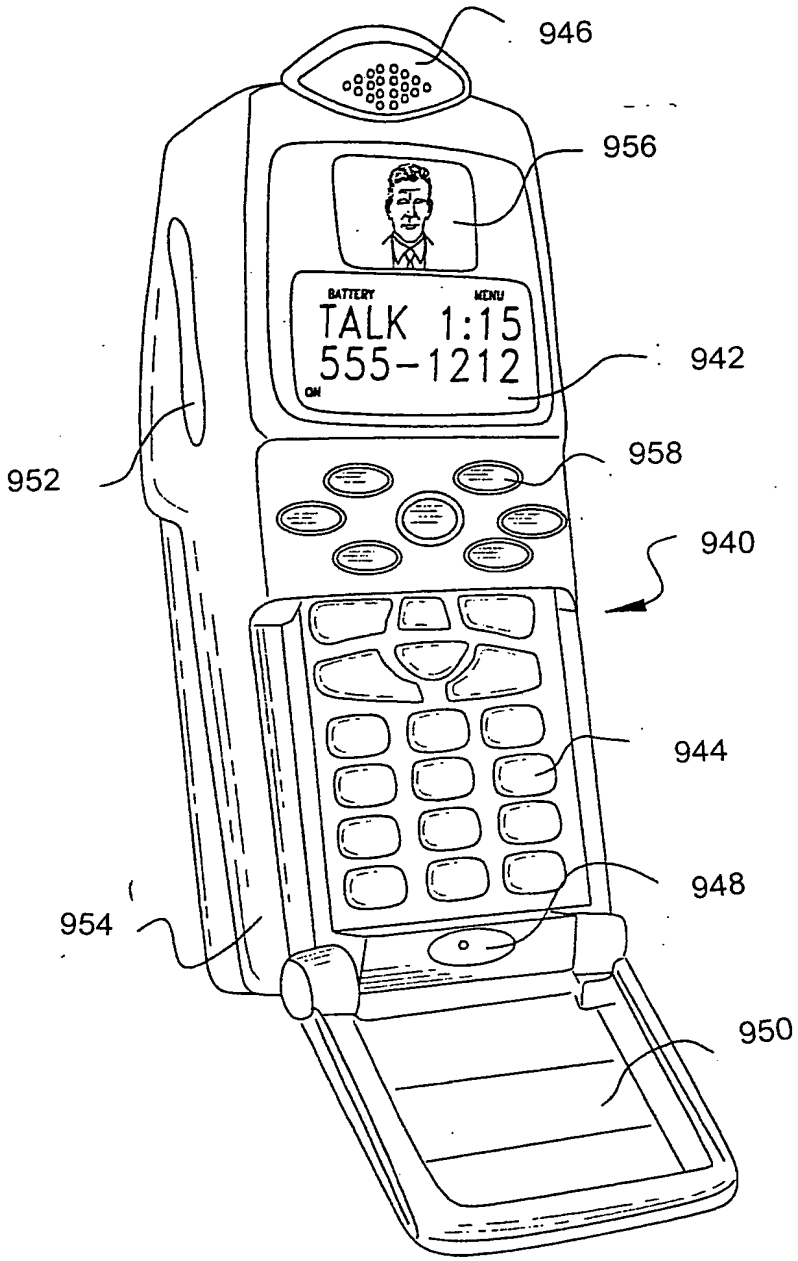

946
956
BATTERY
MENU
TALK 1:15
555-1212
ON
942
952
958
940
944
948
954
950

FIG. 49A

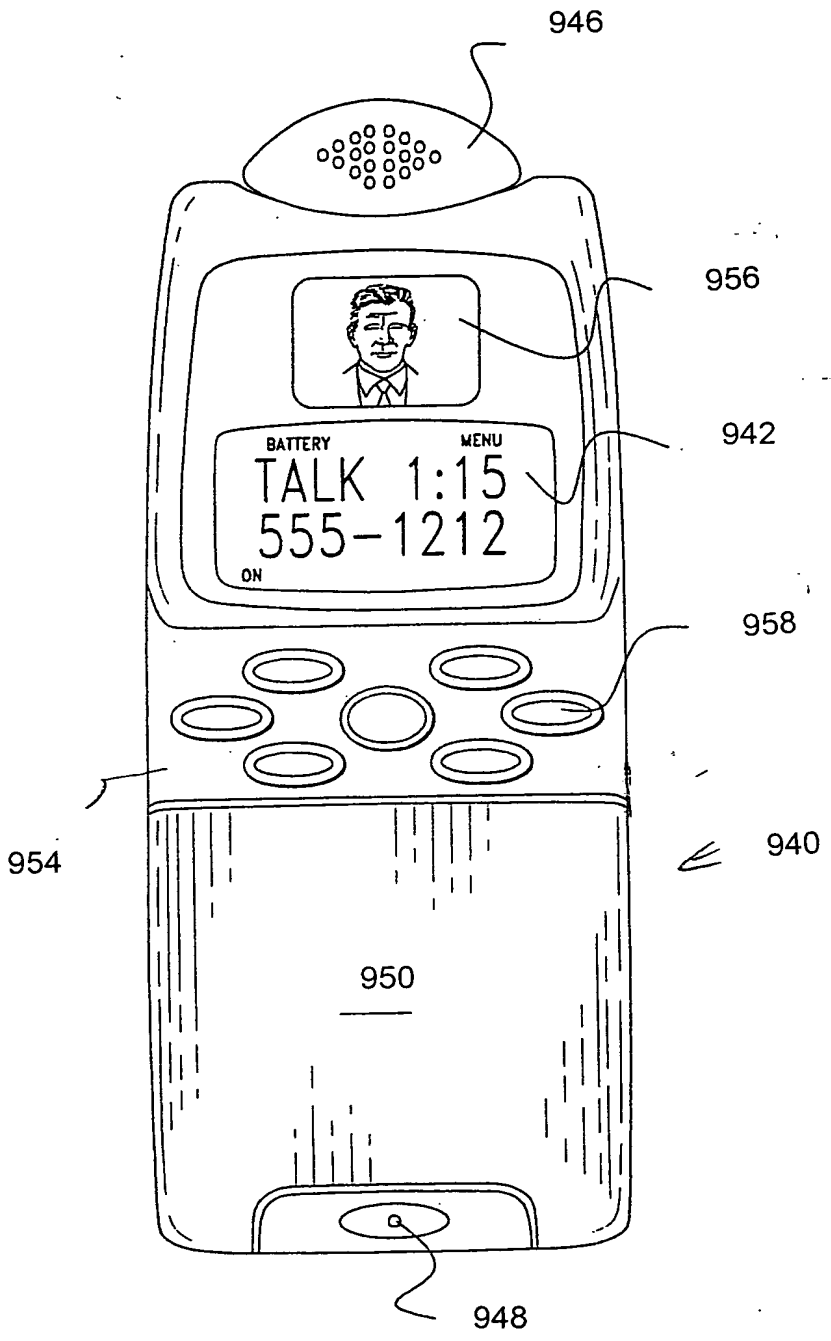

946
956
942
BATTERY
MENU
TALK 1:15
555-1212
ON
958
954
940
950
948

FIG. 49B

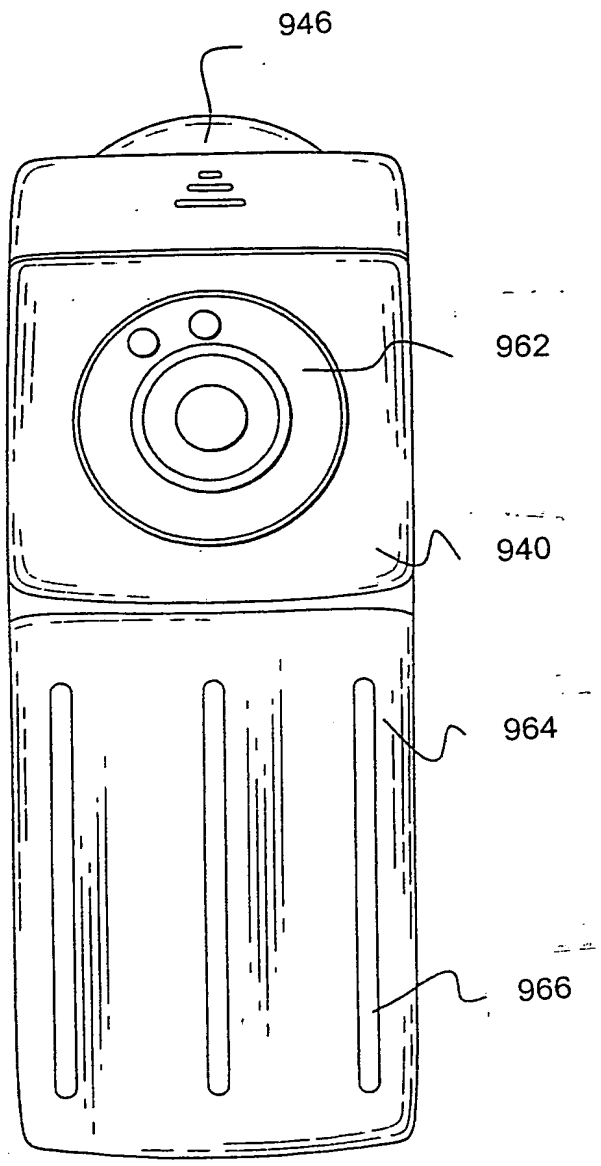


FIG. 49C

6547247 09609460

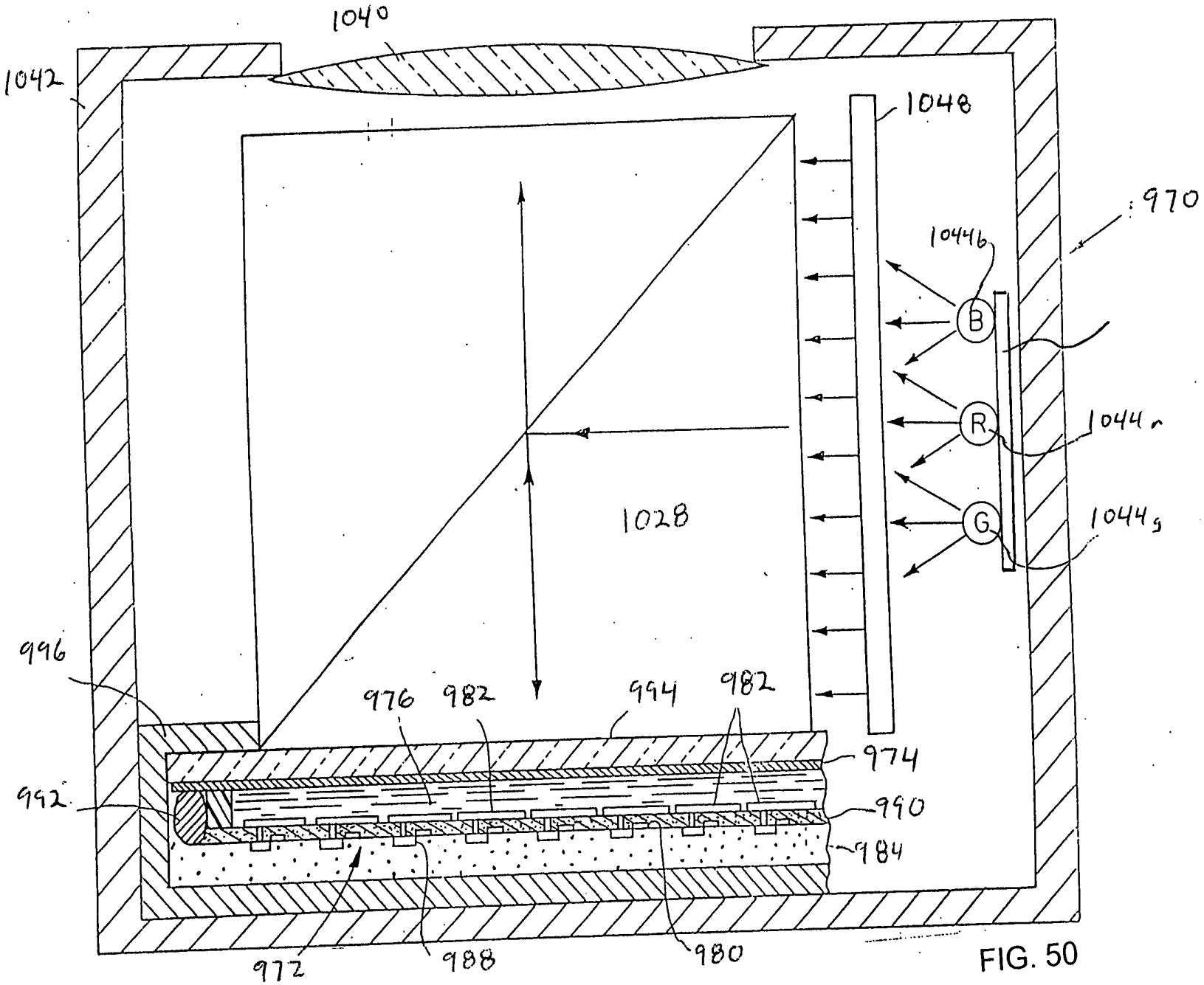


FIG. 50

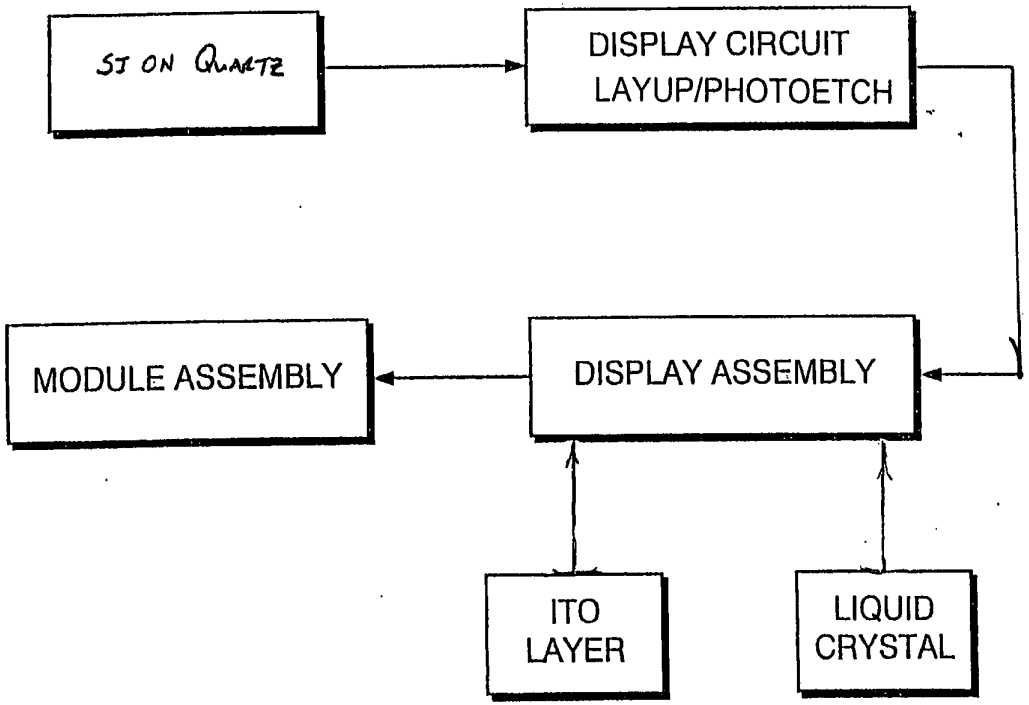

SI ON QUARTZ
DISPLAY CIRCUIT LAYUP/PHOTOETCH
MODULE ASSEMBLY
DISPLAY ASSEMBLY
ITO LAYER
LIQUID CRYSTAL

FIG. 51